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UNIVERSITY OF ALBERTA

THE NATURE OF IMPLICIT KNOWLEDGE OF SENIOR SECONDARY SCHOOL PRINCIPALS

BY

KIRK JACOB SALLOUM ©

A thesis submitted to the Faculty of Graduate Studies
and Research in partial fulfillment of the requirements
for the degree of DOCTOR OF PHILOSOPHY.

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

Edmonton, Alberta
Fall 1993

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Abstract

This study explored the nature of implicit knowledge of senior secondary school principals (grades 10-12) in administering their assigned schools. The exploration was conducted from an interpretive perspective, utilizing assumptions and procedures of naturalistic inquiry. The study's framework, which incorporated a conceptualization of implicit knowledge and its elicitation, was developed using notions derived from the computer and cognitive sciences. Some implicit knowledge was considered to be declarative at one time or was acquired through an implicit learning process, while a portion was viewed as truly implicit. Experiences involving implicit knowledge were detected and delineated.

Five principals from non-urban school districts in western Canada took part in this study. Each participated in three in-depth interviews which were audio-recorded. The principals described incidents involving, and made comments regarding, their implicit knowledge experiences. Further information was collected from a case study exercise and school documentation.

Information from the interviews and the case study was transcribed. The themes of structure, function, context, enhancement, and meaning emerged from a content analysis of the transcripts. Implicit knowledge was detected through structural cues; found to have a variety of functions involving the use of analytic-synthetic skills; used mostly in a human-resource context; and enhanced through experiential activities. The principals valued implicit knowledge, but were cautious with whom they shared their experiences. Normally, sharing occurred after an experience was made comprehensible through an unidentifiable transformation process.

A description of principals' implicit knowledge experiences was compiled from the study's findings. Connectionism and complementary alignment were found to be substantive to their experiences. Principals seldom deliberated on their implicit knowledge experiences and used implicit knowledge to read people for apprizing purposes. Implicit knowledge was idiosyncratic and its elicitation was problematic. In general, implicit knowledge played a major and beneficial role in the senior secondary principalship. The conclusion was made that implicit knowledge requires a higher profile in current thoughts and practices associated with educational administration.

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CHAPTER 1

The Study

Introduction

Perspectives of what school principals do before taking action parallel generic tasks of what administrators do in other organizations. The classical rational model of how administrators think entails solving one well-structured problem at a time and includes, as Isenberg (1984) has suggested, "clarifying goals, assessing the situation, formulating options, estimating likelihoods of success, making . . . [the decision, and] then taking action to implement the decision" (p. 81). A more recent perspective suggests that administrators' thinking is based upon personal and practical experiences.

Sergiovanni (1989) wrote that the principalship is a "'craft-like science' within which professional practice is characterised by reflection, action and reflection episodes" (pp. 7-8). Principals use know-how and relevant technologies to take action. An added dimension to this perspective is provided by Leithwood and Stager (1989) who stated that school principals are also engaged in "'messy' situations" (p. 128) or ill-structured problems.

Many of the studies on how administrators think in practice have a common finding. Studies conducted in educational administration by Leithwood and Stager (1989), and in other domains by Agor (1986b), Benner (1984), Isenberg (1984), and Wagner and Sternberg (1985), have found that the way in which an administrator makes a decision involves the use of implicit knowledge.

The Purpose of the Study

The purpose of the study was to explore the research question of the nature of implicit knowledge of senior secondary school principals (grades 10-12). As a result of the indeterminate nature of the research question, the following six specific research questions were developed as the study unfolded.

1. What are the problems associated with eliciting senior secondary principals' implicit knowledge?
2. What is the structure of implicit knowledge of senior secondary principals?
3. What is the function of implicit knowledge of senior secondary principals?
4. What are the contexts in which senior secondary principals use implicit knowledge?
5. What do senior secondary principals do to enhance implicit knowledge?
6. What meaning do senior secondary principals attach to implicit knowledge?

For more discussion on how the specific research questions were developed see Chapter 2, the section entitled Development of Specific Research Questions.

Background

In the past, interest in improving school administrators' performances has been oriented towards the positivistic tradition or a deductive approach. More recently, writers such as Miklos and Chapman (1986), Murphy and Hallinger (1989), Pohland (1988), and Prestine and LeGrand (1991) have considered an interpretive style or an inductive approach to be a necessary component in the training of school administrators. In both of these approaches, principals are used as subjects to build upon the existing knowledge base of the practices associated with school administration: as an example, principals provide critical incidents so that competencies can be identified.

A variety of research studies have examined how experts and their typical colleagues perform tasks. Wagner and Sternberg (1985) claimed that most of the studies have showed "that experts differ from novices primarily in what they know (i.e., knowledge that can be brought to bear on a task) and in how this knowledge is structured, rather than a general or specific aptitude (i.e., underlying cognitive abilities)" (p. 438). This assertion also holds for studies conducted in a variety of domains by Agor (1989) and Chi, Glaser, and Rees (1982); in nursing by Benner (1984); in business by Isenberg (1984); and school administration by Leithwood and Stager (1989) and Prestine and LeGrand (1991). Wagner and Sternberg (1985) associated this difference with tacit knowledge. This difference has been acknowledged by Benner as practical knowledge involving intuition; studied extensively by Agor as intuitive decision making; and recognized by Berry (1987) using the term "implicit knowledge" (p. 144). These authors are in agreement that this form of knowledge, hereupon called implicit knowledge, is not easily accessible to conscious awareness but, equally important, implicit knowledge experiences can be detected and delineated. (For an operational definition of implicit knowledge see Chapter 2, the section entitled Definition of Implicit Knowledge.)

A review of the literature suggested that once knowledge is elicited it may be useful in educating other people in the same domain. A word of caution was proposed by Lampert and Clark (1990): they claimed that how knowledge is used may not be transmittable to others unless attention is paid to how it is used in an individual's environment. More specifically, in reference to implicit knowledge, is the notion that it can only be taught indirectly and that it is normally developed over time. Agor (1986a, 1986b) and Ray and Myers (1989) have written extensively on the topic in terms of enhancing a person's intuitive abilities. Programs exist that are aimed at developing an administrator's intuitive abilities through practice and awareness activities. According to Agor (1989), such a program was compiled by Ray and Myers for the Stanford University Business School.

Significance

Research on the senior secondary principalship is limited. Moreover, research on the knowledge that school principals possess is sketchy. Studies that discuss principals' implicit knowledge are few. Sergiovanni (1989) recognized that implicit knowledge plays an important role in how principals think, and that an understanding of their implicit knowledge or "informed intuition" (p. 14) would contribute to the study of educational administration.

A limited number of discussions appear in the literature regarding the elicitation of implicit knowledge. What is known comes from the cognitive sciences and the study of programing expert systems in the area of computer science. What appears to be difficult to elicit and totally formalize is what Hertz (1988) referred to as "the intuitive flashes of insight that come to almost all of us from time to time," (p. 44) or what Berry (1987) referred to as implicit knowledge. Berry, Davies and Hakiel (1988), and Hertz suggested that interviews can be used to detect implicit knowledge experiences.

An exploration into the research question was conducted from an interpretive perspective using interviews. Information elicited through the interviews was then used to compile an approximate description of the nature of implicit knowledge of senior secondary school principals. This description could not formalize principals' implicit knowledge or allow for firmly grounded generalizations. Instead, insight was provided into the nature of principals' implicit knowledge and its implications for the field of educational administration.

Assumptions

The following assumptions were made:

1. What was outlined in the literature as to the nature and elicitation of implicit knowledge of administrators from other domains in North America was applicable to senior secondary school principals in western Canada.

2. The respondents could recall their past activities involving implicit knowledge and that these recollections would provide insights into the nature of implicit knowledge of senior secondary school principals.

3. Sufficient information could be collected in the time period that the study was conducted so as to reveal significant experiences of the respondents.

4. The mode of inquiry was appropriate for exploring the research question and the investigator's interaction with the respondents might alter the nature of the information collected.

Delimitations

This study was delimited:

1. To senior secondary school principals in a region of a province in western Canada.

2. To senior secondary school principals who were approached by the investigator and who administered schools in non-urban communities.

3. To experiences that the respondents were able to recall up to March 1992.

4. As a result of the wealth of data collected, to incidents and quotes selected by the investigator as being representative of the information elicited from each respondent.

Limitations

1. The data elicited from the respondents might be affected by immediate experiences involving implicit knowledge; inaccurate recall of past experiences; or specific features of the respondents' contextual situations, such as school size and geographic location.

2. The study was limited to the perceptual data collected from respondents because they in part selected the implicit knowledge being sought.

3. The study was limited to the time of year and the narrow time frame in which the data was collected, because these data could change over time.

Definition of Terms

Action and Decision. The terms action(s) and decision(s) are used interchangeably.

Analytic and scientific. These three words have been used as adjectives with such words as "means," "methods," "knowledge," and "skills." When these terms have been used in conjunction with implicit knowledge, they suggest a conscious act. For example the statement, "Implicit knowledge was used in conjunction with analytic and scientific methods," indicates that the "methods" were consciously employed.

Rationalizing after the fact. This term, or the like, when used in reference to implicit knowledge means to transform the employment of implicit knowledge (be it knowledge per se or a process) into something that can be comprehended and valued by others. To determine the accuracy of the transformation was beyond the scope of this study. The term must not be confused with the notion of formulating a rationale for using implicit knowledge.

Situation. The terms situation(s, al) and contextual situation(s), when used in reference to a respondent's background and setting, are used synonymously.

Training. The term training is used in the same way that Murphy and Hallinger (1989) used it: that is, "to denote any experience designed to promote the professional development of programme participants" (p. 23). Training includes the dimensions of preservice, inservice, and continuing education.

Overview of the Thesis

Outlined in the first chapter is the research question, the significance of the study, and the definitions of terms. Chapter 2 reviews the literature related to conceptualizing and eliciting implicit knowledge, gives an operating definition of implicit knowledge, and discusses the development of the specific research questions and the study's framework. Chapter 3 describes the mode of inquiry and research design. Chapter 4 gives background information related to the respondents and their assigned schools. The five themes that emerged are outlined in Chapters 5 through 9: respectively, they are structure, function, context, enhancement, and meaning. Chapter 10 provides a summary of the study and the findings, followed by the investigator's interpretation of each respondent's use of implicit knowledge. The conclusion, recommendations for practice, implications for future research, and the investigator's reflections are outlined in Chapter 11, followed by the Bibliography and the Appendices which contain pertinent information relating to the study.

CHAPTER 2

Literature Review

Introduction

To explore the research question, the investigator reviewed the literature related to implicit knowledge and its elicitation. The chapter begins with a discussion on a conceptualization of implicit knowledge. This is followed by an outline of the salient aspects related to the elicitation of implicit knowledge. The chapter ends with an operating definition of implicit knowledge, followed by discussions on how the specific research questions were developed and on the study's framework.

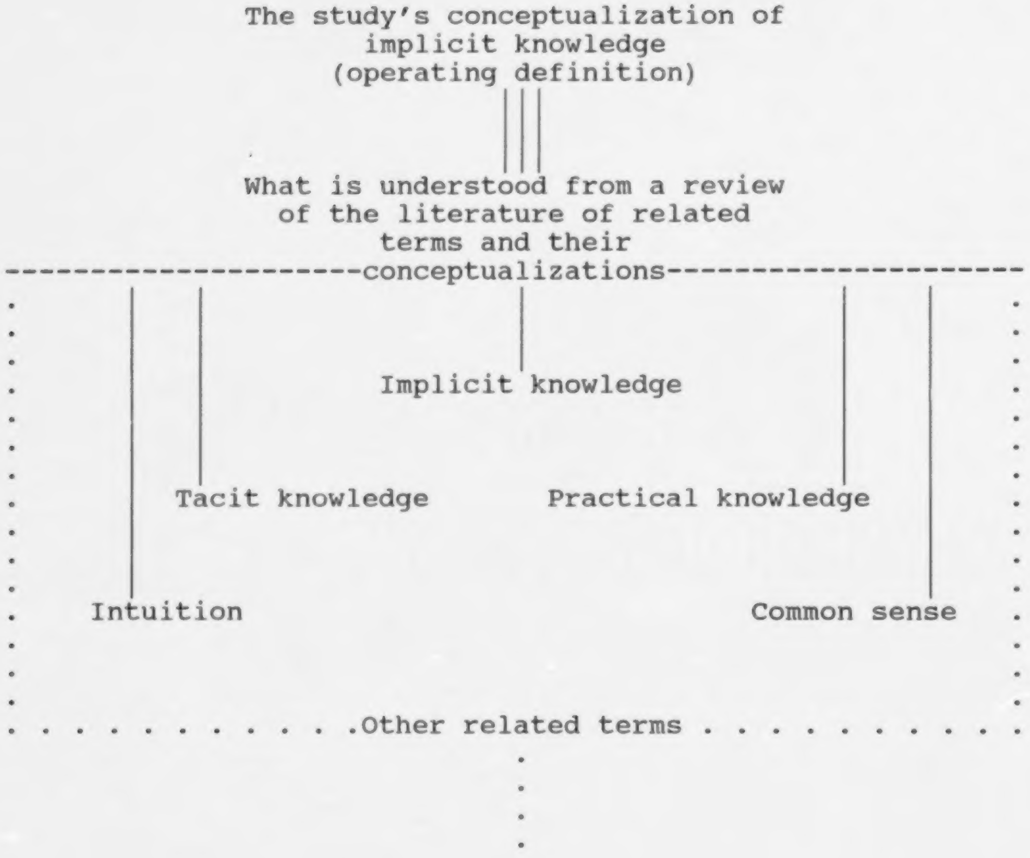
A Conceptualization of Implicit Knowledge

No conceptualization of implicit knowledge for exploring the research question existed in the literature. A review of the literature indicated that a conceptualization could be constructed using information that was relevant to an understanding of implicit knowledge. Any discussion on implicit knowledge focused on its elicitation. Conceptualizations of terms related to implicit knowledge were considered to be either ill defined or too restrictive for the research question. Few writers have attempted to discuss the relationship between implicit knowledge and related terms. To formulate a conceptualization of implicit knowledge, a multitude of literature was reviewed as the study unfolded. The terms that appeared in the literature, including and related to implicit knowledge, can be placed into five categorizes: common sense, intuition, practical knowledge, tacit knowledge, and implicit knowledge (see Figure 1).

Common Sense

Any conceptualizations of the term common sense were ill defined or undefined. The term was often used to clarify a related idea. Buchanan (1986) and Hertz (1988) pointed out that programing expert systems involved inputs of people's knowledge in the form of a set of rules. They suggested

Figure 1. Formulation of the study's conceptualization of implicit knowledge.


The study's conceptualization of implicit knowledge (operating definition)
What is understood from a review of the literature of related terms and their conceptualizations
Implicit knowledge
Tacit knowledge
Practical knowledge
Intuition
Common sense
Other related terms

that if expert systems were programed with common sense, the systems would perform better. Rather than discussing what they meant by common sense, Buchanan and Hertz used the term to supplement their discussions. Buchanan also described a situation where an expert system performed poorly, and explained that the persons using the system were able to work with it because they possessed the needed common sense. In her research on the scientific knowledge of two groups of students, 14 and 17 year olds, Law (1988) used the term in reference to constructing a "commonsense 'theory'" (p. 1) and equated the term with "intuitive ideas" (p. 1). She claimed that students' frameworks for conceptualizing motion in physics involved more than a set of rules or mathematical relationships. Law concluded that intuitive ideas were woven into students' formal knowledge of motion.

Intuition

There were diverse conceptualizations of intuition. At the same time, the conceptualizations had common features. Goldberg (1983) viewed intuition as "nonautomatic" (p. 41). In their work on how novices become experts, Dreyfus and Dreyfus (1986) considered the phrase "expert systems" to be misleading because experts could do something more than the systems. They referred to that extra something as intuition. Further, Dreyfus and Dreyfus suggested that the limited amount of literature on the use of intuition may be a result of an incorrect understanding, and lack of acceptance, of intuition in making deliberate decisions.

The literature on how women perceive the world was a valuable source of information for building an appreciation of the importance and complexity of intuition in decision making. Belenky, Clinchy, Goldberger, and Tarule (1986), in their examination of women's ways of knowing about truth and knowledge, found that half of the 135 women they interviewed could be considered subjectivists. In their conceptualization of subjectivism, Belenky et al. considered truth and knowledge to be "personal, private, and subjectively known or intuited" (p. 54). This intuitive trait is not considered by some writers and theorists to be bound by gender.

An effort has been made to ascertain individuals' intuitive characteristics, be they female or male. According to Cunningham (1985), the Myers-Briggs Type Inventory (MBTI) is a respected test for assessing personality characteristics. Application of the MBTI has indicated that there are two ways that people prefer to perceive: one, the process of sensing, where the five senses are used directly to become aware of things; and two, the process of intuition, where an indirect perception that has been formed by unconsciously incorporating ideas to external perceptions. Myers and Myers (1980) stated that "these unconscious contributions range from the merest masculine 'hunch' or 'woman's intuition' to the crowning examples of creative art or scientific discovery" (p. 2). Assumptions underlying the MBTI also yield useful information regarding the nature of implicit knowledge. Myers and Myers (1980), backed by a long history of applying the MBTI, claimed that all people are born with the two processes of perception; that "the processes are at each person's disposal to develop" (p. 201); and "that one process is more appropriate than another in a given situation" (p. 201).

The review of the literature also showed that intuition is used in creative situations. Ennamorato (1986) wrote about three stages that an intuitive user applies in creative thought: one, preparation, the process of consciously working over a problem; two, incubation, a process where there is no conscious thought about the problem; and three, illumination, where there is a solution. Halseth (1989) in her study on how human service administrators use intuition in decision making adds a fourth stage, that of verification. This is where the intuitive user consciously or unconsciously evaluates or assesses the solution. What Ennamorato and Halseth were suggesting was that people used rational thought in some stages and then relied on intuition in another stage. How the brain operates in these stages has been explained in the "split brain theory."

A popular conceptualization of intuition comes from the physiological research on "split brains" (Simon, 1989, p. 26). This research suggested that the left hemisphere of the brain plays a vital role in analytical and logical processes, while the right hemisphere plays a special role in creative and intuitive processes. Simon claimed that this research was a "red herring that can only impede our understanding of intuitive . . . thought" (p. 27). He also claimed that this polarized 'theory' was not important in issues related to decision making, rather what was crucial was how people used the two processes. Simon stated, "the two processes are essential complementary components of effective decision-making systems" (p. 33). Further support for this claim was found in Mintzberg's (1976) study on how corporate executives operate. He concluded that "organizational effectiveness does not lie in the narrow-minded concept called 'rationality'; it lies in a blend of clear-headed logic and powerful intuition" (p. 58).

Agor (1985, 1986a, 1986b, 1989) conducted studies on, and has written extensively about, intuition in administrative decision making. Selected questions from the MBTI were used by Agor (1985, 1986a, 1986b) in testing the intuitive abilities of over 2,000 managers from private and public American organizations. Findings from this study are reported in Agor's (1989) book, Intuition in Organizations. Also included in this publication are essays that discuss intuition at length (Goldberg, 1989; Simon, 1989; Rowan, 1989; Vaughan, 1989). These findings and writings were valuable to understanding intuition, but much of what was written was unnecessary to defining implicit knowledge and the related term of intuition. For this study what was important has been expressed by Agor (1989):

> My operating definition for intuition . . . is that it is a rational and logical brain skill that can be used to help guide decision making. It is not paranormal. . . . Intuition is a product of a series of input sources including both factual and feeling cues. (p. 15)

In keeping with this, Bruner (1960) claimed that

> intuitive thinking rests on familiarity with the domain of knowledge involved and with its structure, which makes it possible for the thinker to leap about, skipping steps and employing short cuts in a manner that requires a later rechecking of conclusions by more analytic means, whether deductive or inductive. (p. 58)

A parallel idea was found in the term informed intuition. Ennamorato (1986) quoted a business executive who stated that "'informed intuition is the ability to instantly synthesize altogether too much information quickly'" (p. 54). A similar but more precise definition was found in the field of educational administration. Sergiovanni (1989) stated: "Professionals rely heavily on informed intuition as they create knowledge in use. Intuition is informed by theoretical knowledge on the one hand and by interacting with the context of practice on the other" (p. 14). In this view, intuition is used by professionals in ill-structured situations. By relying upon interrelated components of administrative practice, such as theoretical knowledge and professional experience, administrators go through a process to inform professional practice.

Practical Knowledge

Descriptions or details of practical knowledge were limited. Generally, it was discussed in the realm of a specific domain or context and associated with related terms. Just as Bruner (1960), Ennamorato (1986) and Sergiovanni (1989) recognized that there was a form of knowledge related to practice, Rowles's (1991) study of expert teachers acknowledged this knowledge as being informed by wisdom. Rowles found that expert teachers employing wisdom had an in-depth knowledge of teaching procedures and curriculum; searched for procedures to improve student performance; and used a variety of teaching strategies to achieve success. While recognizing the ability of experts to use wisdom, Rowles limited her investigation of the nature of that wisdom to its operational dimension.

In her study of expert nurses, Benner (1984) acknowledged the use of practical knowledge. She stated that "expert nurses often describe their perceptual abilities using phrases such as 'gut feeling,' a 'sense of uneasiness,' or a 'feeling that things are not quite right'" (p. xviii). Not only are these phrases associated with practical knowledge but, as Benner implied, they can be studied systematically. Benner realized that practical knowledge was related to an expert's ability to perceptually grasp a situation in context and considered this knowledge to be associated with what Polanyi (1958) termed "connoisseurship" (p. 54). Complementary to Benner's and Polanyi's ideas is de Bono's (1990) "water logic," way of thinking. He suggested that

> in traditional (rock) logic we have judgements based upon right/wrong. In perception (water) logic we have the concepts of 'fit' and 'flow'. The concept of 'fit' means: 'Does this fit the circumstances and conditions?' The concept 'flow' means: 'Is the terrain suitable for flow to take place in this direction?' Fit and flow both mean the same thing. Fit covers the static situation, flow covers the dynamic situation. (p. 291)

The ideas related to context, connoisseurship, and fit and flow paralleled ideas connected with what has been termed tacit knowledge.

Tacit Knowledge

Conceptualizations of tacit knowledge were considered as occurring in a particular entity, or context, and normally ignored notions related to intuitive experiences. In his work on professional practice, Sergiovanni (1989) spoke not only of informed intuition but also of tacit knowledge. He claimed that tacit knowledge was "not usually expressed openly or taught" (p. 18) and that it was important to shaping the practical intelligence of individuals. He based this claim on Wagner and Sternberg's (1985) work on the role of tacit knowledge of business managers.

Wagner and Sternberg (1985) referred to tacit knowledge as that "knowledge that is usually unverbalized and not explicitly taught" (p. 437). Their study revealed that "tacit knowledge was not related to verbal intelligence as measured by a standard verbal reasoning test" (p. 436), and that managers used tacit knowledge to manage oneself, others, and one's career. Wagner and Sternberg concluded that further research was needed on tacit knowledge elicitation.

Insight into the salient aspects of this research are found in writings by Johnson (1983) and Polanyi (1958, 1966, 1969) on how humans learn. Johnson pointed out that there were at least three phases of learning: the stage of cognition or thought; the associative phase of learning; and the stage of automaticity. Johnson maintained that when the third phase of learning had been achieved, tasks were carried out in a "smooth and proficient" (p. 79) manner. He further pointed out that the knowledge learned in this phase was not easily expressed at a conscious level. This knowledge, Johnson pointed out, was what Polanyi (1966) called tacit.

Polanyi (1966) considered that "*we can know more than we can tell*" (p. 4) and called this tacit knowing. He discussed four dimensions of tacit knowing. One, Polanyi considered to be the "*functional structure*" (p.10). As an example, he suggested that an individual recognizes a person's facial features by *relying* on an awareness of the features in relation to the face's appearance. Two, he called the "*phenomenal structure*" (p. 11). Using the example of the face, an individual is aware of the facial features and his or her internal processes in terms of the face's appearance to which the individual is attending. Three, what Polanyi labelled the "semantic aspect" (p. 13), is the meaning given by combining the functional and phenomenal structures. Using the face example once again, Polanyi claimed that a characteristic appearance of a face, or the mood expressed in a face, is the joint meaning or interpretation of the face's features. Four, Polanyi labelled the ontological aspect. This aspect is concerned with "the understanding of the comprehensive entity" (p. 13) by indwelling: dwelling in the entity. In other words, if the entity was studied as particulars, a person's awareness of the entity is incomplete.

By bringing together the ideas that have been associated with common sense, intuition, practical knowledge, tacit knowledge, and with what the literature on expert systems had termed implicit knowledge, a conceptualization of implicit knowledge was developed.

Implicit Knowledge

Various terms appeared in the computer science literature which referred to the knowledge that people have difficulty making explicit. To define each of these terms is involved and was deemed unnecessary. For research purposes, a synthesis of the ideas associated with each term was done so as to formulate, first, an operating definition of implicit knowledge, and then a conceptualization of it.

Some of the terms that appeared in the computer science literature have already been mentioned and are worth repeating, while others are less familiar and are considered self-explanatory. (A less familiar term which will be discussed in detail is implicit knowledge.) In brief, reference to knowledge that was linked to implicit knowledge was found to be referred to as common sense (Dreyfus & Dreyfus, 1986; Hertz, 1988); intuition (Buchanan, 1986; Dreyfus & Dreyfus, 1986; Hertz, 1988); practical knowledge (Benner, 1984); tacit knowledge (Berry, 1987; Johnson, 1983); expertise (Davies & Hakiel, 1988; Hertz, 1988; Johnson, 1983; Sharman & Kendall, 1988); knowledge gathered in a heuristic method (Boose, 1985; Hertz, 1988); parallel thinking and connectionism (Wiegner, 1992); deep knowledge and knowledge that experts possess (Berry, 1987; Boose, 1985; Davies & Hakiel, 1988; Kidd & Cooper, 1985; Sharman & Kendall, 1988; Taschdjian, 1989; Wielinga & Breuker, 1985); and, the term itself, implicit knowledge (Berry, 1987; Sharman & Kendall, 1988).

Prior to the pilot being conducted, and from a review of the literature, the operating definition of implicit knowledge was formulated (see this chapter's section entitled Definition of Implicit Knowledge) as part of the study's framework. A conceptualization of implicit knowledge, including its elicitation, was formulated using salient ideas from the on-going literature review which was conducted as the study unfolded. Though a number of different terms have been used in studies related to implicit knowledge, similar findings have been reported. These findings included the idea that administrators use something else (herein called implicit knowledge) besides explicit knowledge in decision making and that this implicit knowledge is important to how they perform their jobs.

Outlined in the remainder of this section are the details of this conceptualization of implicit knowledge. The conceptualization has been framed within the five themes that emerged. (Details related to the elicitation of implicit knowledge are outlined in the next section.) Implicit knowledge was found to have a structure, was found to have a function, was used in certain contexts, was found to have various meanings to people, and was able to be enhanced. Though the terms used to label the themes are often associated with positivistic studies, the investigator felt, after much deliberation and searching for other terms, that these were apt for reporting the findings of this interpretive study.

Structure. Researchers have found that people described their implicit knowledge experiences in various forms and shapes. These descriptions were reported in studies on intuition by Goldberg (1983) as "'vibrations'" (p. 208); "vague hunches and feelings" (p. 21); "something doesn't *feel* quite right" (p. 33); and "a vague, hazy sensation, providing little more than a sense of direction" (p. 39). Agor (1986b) reported the descriptions as "'a sense of excitement--almost euphoric'" (p. 31) and "'a feeling of total harmony" (p.31). Other phrases and words included: "'aha'" (Isenberg, 1984, p. 85); "'Eureka factor'" (Agor, 1989, p. 14); and "feelings of bliss, awe, wonder and joy" (Vaughan, 1989, p. 46). Benner (1984) in her study on practical knowledge found respondents reporting the structure as a gut feeling, a sense of uneasiness, and a feeling that things are not quite right. Belenky et al. (1986) reported that their respondents used such phrases as "'something inside'" (p. 57), "'infallible gut'" (p. 56), "'I just know'" (p. 68), and "'hits you dead in the face'" (p. 70).

Vaughan (1989) discussed intuitive experiences as occurring on four levels: one, the physical level, which involves body responses or sensations; two, the emotional level, which are intuitive experiences that come through feelings; three, the mental level, which includes experiences that evolve through the formation of patterns or images of conscious and unconscious thought; and four, the spiritual level, which involves experiences (such as meditative and mystical experiences) which do not depend upon and interfere with the other three levels. Furthermore, the spiritual level "apprehends the totality of a given situation" (Vaughan, 1989, p. 56).

Goldberg (1983) described intuitive experiences, when they are "*vivid*" (p. 79), as coming in three modes: verbal, visual, and kinesthetic. In less vivid instances, people get frustrated expressing their experiences in these modes because the experiences are difficult to articulate in everyday language. Furthermore, people are unaware of their experiences in these modes and often their expression is an adulteration of the original, intuitive experience. In the verbal mode, inner messages come to people. In the visual mode, people see diagrams or patterns, or the like. In the kinesthetic mode, people experience physical sensations. Goldberg also acknowledged that there is an overlapping of these modalities.

For the purpose of this study, these levels and modalities were used to assist in delineating the forms and shapes of the study's five respondents' experiences with implicit knowledge. Because Vaughan's (1989) idea of levels implies a hierarchy and, as Goldberg (1983) pointed out, the modalities "create distortions" (p. 80), this study used the term structure. This reconceptualization suggests more of an emphasis on the investigator's interpretation and configuration of the respondents' descriptions of their implicit knowledge experiences, as opposed to a focus on ideal types or people's abilities or preferences. Closely connected to the structure of implicit knowledge was its functional aspect.

Function. Insight into the function of implicit knowledge was largely derived from the literature on how administrators use it to make decisions. Generally, writers considered that implicit knowledge was used in decision making. More specifically, many writers were in agreement with Polanyi (1966) and Sergiovanni (1989) that tacit knowledge was used to shape thoughts. Isenberg (1984) stated that administrators "in addition to depending on their ability to analyze, they also rely heavily on a mix of intuition [implicit knowledge] and disciplined analysis in their decision making and incorporate their action on a problem into their diagnosis of it" (p. 81). He further considered that administrators "have general overriding concerns and think more often about how to do things than about what is being accomplished" (p. 81). Leithwood and Stager (1989) claimed that administrators were often required to solve problems that were ill structured, and that they were unlikely to fully apply the classical rational model of problem solving.

Researchers have been unable to fully grasp what intuition is and, as Isenberg (1984) stated, some "see it as the opposite of rationality, others use it as an excuse for capriciousness, and currently some view it as the exclusive property of a particular side of the brain" (p. 85). Isenberg's statement is in keeping with Agor's (1989), Goldberg (1983), and Simon's (1989) conceptualizations of intuition and other terms related to implicit knowledge because the statement considers intuition to be part of the decision-making process.

Through a limited number of studies, the investigator was provided with insights as to how administrators from various domains employed implicit knowledge in their decision making. These studies indicated that implicit knowledge, or its respective terms, had the following functions.

1. In general, it is used by middle-level and upper-level administrators in the decision-making process and in major decisions (Agor, 1986a, 1986b; Riggs, 1986; Taylor, 1989). Agor's (1986a, 1986b) study of American administrators, from a variety of domains, indicated that there was a significant difference between the intuitive abilities of upper-level and middle-level administrators: upper-level administrators tended to show higher ratings of intuitive ability. A study done by Riggs (1986) of administrators in 93 major corporations showed no significant difference. Taylor's (1989) phenomenological study of ten administrators found that both upper-level and middle-level administrators used intuition in their decision making.

2. It is used to sense that a problem exists (Halseth,

1989; Isenberg, 1984).

3. It is used to pick up information and possible solutions where scientific or analytic information is of little use or is lacking, or where no problem-solving precedent exists (Agor, 1986a, 1986b; Halseth, 1989; Isenberg, 1984; Taylor, 1989).

4. It is used as a verification or checking device (Halseth, 1989; Isenberg, 1984).

5. It is used where there is limited time, or there is pressure, to make a decision (Agor, 1986a, 1986b).

6. It is used where evidence indicates that there is more than one possible solution (Agor 1986a, 1986b).

7. It is used to analyze data in a wholistic or global way rather than the sum of the parts (Isenberg, 1984).

These functions of administrators' implicit knowledge proved useful in examining the nature of implicit knowledge of senior secondary school principals and the contexts in which that knowledge was used.

Context. Most studies showed, mainly as a result of a secondary research question, that implicit knowledge was used in particular aspects of the job. Halseth (1989), Isenberg (1984), and Johnson (1983) claimed that such knowledge was used to perform tasks in a smooth and rapid manner in a wholistic context. An example of this was given by Isenberg who discussed how administrators took people into consideration in budgetary matters. Studies conducted by Agor (1986a, 1986b), Benner (1984), Halseth (1989), Isenberg (1984), Taylor (1989), and Wagner and Sternberg (1985) reported implicit knowledge being used to solve personnel problems. Wagner and Sternberg found that tacit knowledge (implicit knowledge) was used "for managing oneself, others, and one's career" (p. 436). The literature on context also alluded to the idea that implicit knowledge proficiency increased over time.

Enhancement. Most of the writers proposed that implicit knowledge was developed through experience and particular activities. Suggestions for enhancement were found in the literature on intuition. Agor (1985, 1986a, 1986b), Myers and Myers (1980), and Ray and Myers (1989) claimed that every person was born with an intuitive process that is at the person's disposal to develop. Agor found that administrators enhanced their intuition through a variety of activities which paralleled those found in programs that were developed by Ray and Myers for enhancing administrators' intuitive abilities. Agor and Ray and Myers suggested that intuitive abilities were increased through a variety of techniques which include relaxation and analytic exercises. More specifically, the exercises involve writing, meditation, physical exercise, mind mapping, reading, and involvement with support groups. Programs related to these enhancing techniques, and developed by Ray and Myers, have been "introduced successfully in the curriculum at the Stanford University Business School" (Agor, 1989, p. 215). In her study, Halseth (1989) concluded that enhancement of a person's ability to use intuition comes about through working with people and through a non-repressive organizational climate. Closely related to a non-repressive setting is the meaning that people in the past have attached to implicit knowledge.

Meaning. Studies have pointed out how ideas related to implicit knowledge have been culturally viewed in a nebulous manner. Agor (1986b) noted that, prior to the mid-1970s, he would have been unable to conduct his study due to the extreme reluctance that administrators had in discussing how intuition was used in decision making. Agor claimed that administrators were becoming more open. Ennamorato (1986), however, believed that a barrier still existed: "Our culture has conditioned us to believe that the most successful forms of reasoning involve a logical approach, yet when carefully investigated, many decisions seem to be arrived at by a seemingly spontaneous or intuitive mode" (p. 50).

As has been discussed, a variety of phrases have been used to describe implicit knowledge experiences. These phrases are themselves telling. As one example, the phrase "'woman's intuition'" (Myers & Myers, 1980, p. 2) illustrates the perception that people have had of the ideas related to implicit knowledge. In this perception, intuition has been mainly associated with females rather than males. For this study, the gender issue was of minor concern because of the limitations imposed on the selection of respondents. That is, no female senior secondary school principals were available as potential candidates (see Chapter 3 for a further explanation). Nevertheless, the literature focusing on the gender issue was important to the research question and provided insight into the meaning that the respondents attached to the ideas related to implicit knowledge.

In his research, Agor (1986b) acknowledged the importance of the gender issue. He found that there was a statistically significant difference between male and females regarding their intuitive ability. He further explained that a possible reason for this difference could be attributed to the physiological growth patterns of the brain for men and women. Agor also explained that

> another possible explanation is that women have learned culturally to use and develop their native intuitive ability. In contrast, men historically have learned through societal and cultural pressure to suppress feelings and to rely on deductive processes vs. inductive ones. (pp. 18 & 20)

Ennamorato (1986) stated:

> There is no question that men not only possess intuition, but use it all the time. Witness the men in business and politics. They may operate from facts, but again, you have to trust your feelings, impressions and intuitions. . . ." (p. 48)

To determine if these views were accurate was not at issue in this study. What was important was twofold. One, there was the realization that these views existed in a societal context and that these views might have influenced the five respondents. Two, the host of literature related to implicit knowledge focusing on the female gender was a valuable source of information.

In summary, the literature alluded to the idea that women had traditionally been more willing than men to talk about their implicit knowledge experiences. In general, administrators in the past have been reluctant to talk about their experiences and are now more open. This recent willingness to talk about experiences, overshadowed by a history of reluctance, was crucial to the elicitation of implicit knowledge.

Elicitation of Knowledge

Administrators use both explicit and implicit knowledge to perform a task, and both can be elicited through a variety of techniques. Research on knowledge elicitation has focused mainly on explicit knowledge and, as Berry (1987) suggested, little attention has been paid to implicit knowledge.

Types of Implicit Knowledge

Implicit knowledge, as Berry (1987) has stated, "cannot be easily accessed or communicated" (p. 145). Berry further alleged that some implicit knowledge was impossible to elicit. She pointed out two types of implicit knowledge that could be elicited. One, she discussed as declarative knowledge that transforms into procedural form. This referred to knowledge that is used so often that it becomes automatic and the individual loses the ability to report how s/he uses that knowledge. This is similar to what Johnson (1983) referred to as the knowledge achieved at the stage of automaticity. This type of implicit knowledge distinguishes itself from intuition. As mentioned, Goldberg (1983) considered intuition to be "nonautomatic" (p. 41). The other type of elicitable implicit knowledge that Berry wrote about was knowledge that was never declarative but was gained as the result of implicit learning processes. Berry pointed out a third type of implicit knowledge which she labelled "true implicit knowledge" (p. 147). This is implicit knowledge that can not be elicited no matter the elicitation technique.

Types of Techniques

Berry (1987) and other researchers have suggested possible elicitation techniques for the two elicitable types of implicit knowledge. Moreover, since people have difficulty reporting their implicit knowledge directly, techniques must be used to elicit that knowledge indirectly. Berry, Johnson (1983), and Sharman and Kendall (1988) further recognized that the elicitation of people's knowledge in a particular domain must take place in that domain. They also acknowledged that techniques used in one domain could also be applied to other domains.

Though Berry (1987) discussed different types of implicit knowledge, she and other writers did not suggest a particular technique be used with any one type. A widely used elicitation technique is that of interviewing people about the knowledge they have employed when carrying out activities.

Berry (1987) outlined another elicitation technique. She suggested that people provide a recorded running commentary, or to use Johnson's (1983) term, a process trace, of a task being carried out. The commentary is transcribed and analyzed for data concerning the person's knowledge and problem-solving strategies. This technique enables the researcher to model the procedures that the person uses in the solving of a problem and that are difficult to articulate. Another form of this technique was used by Sharman and Kendall (1988) in a simulation where the person was asked to explain how s/he went about solving a problem. Their analysis showed that "simulation provides a good opportunity for analyzing causal relationships, which depend on information flow between components. In this way, we can apply domain knowledge to confirm and elaborate on conclusions reached earlier in heuristic phases" (p. 36).

Sharman and Kendall concluded that this technique exposed the person's conceptual framework as well as their reasoning processes.

Another technique mentioned by Berry (1987) was that of machine induction. The principle underlying this technique is that an expert provides the relevant factors or attributes influencing a number of different decisions. These raw data are fed into an expert system that generates a set of rules using an inductive algorithm. This set of rules results in the "formulation of the decision process" (p. 149). What was crucial to this technique for the research question was not the set of rules or the decision process, rather the notion that people are able to provide the relevant attributes used in making a decision.

For this study, what was important about the interview, machine induction, and running commentary techniques was that they provided representations of people's knowledge. Since people have difficulty reporting their implicit knowledge directly, these techniques assisted in detecting the implicit knowledge indirectly. In this study, respondents sometimes commented on their implicit knowledge experiences, while at other times they described their experiences through stories or incidents. There are, however, problems associated with these techniques which have been cited in the elicitation literature.

Problems of Elicitation

Berry (1987) and Johnson (1983) recognized the problem of being unable to elicit all implicit knowledge. Berry suggested that elicitation research be carried out to develop techniques for identifying implicit knowledge that is presently not elicitable but has the potential to be elicited. Another problem recognized by Berry was that of formalizing the implicit knowledge, especially for programing purposes. She stated that these problems of elicitation "should not be considered as an insurmountable obstacle, but rather should be thought of as a challenge"

(p. 150). The investigator became aware, as the study unfolded, that the problems were of minor consequence. What was important to the investigator was to keep in perspective the research question in relationship to these elicitation problems. To understand how this was accomplished an examination of the research question, in conjunction with a brief summary of the literature, is helpful.

This study looked at the nature of implicit knowledge of senior secondary school principals. The literature suggested that all people have implicit knowledge at their disposal to develop; that administrators used implicit knowledge to carry out tasks; that implicit knowledge was situational; that some of the implicit knowledge that was declarative at one time, or was difficult to articulate and demonstrate, can be elicited; and that the elicitation techniques can not detect all knowledge that is implicit. Since this study was concerned with the nature of implicit knowledge, then to formalize principals' implicit knowledge was unnecessary. To be able to detect and delineate implicit knowledge in given situations was vital. Also important, was the formulation of an operational definition of implicit knowledge.

Definition of Implicit Knowledge

As previously mentioned, this operating definition of implicit knowledge was formulated prior to the pilot. The definition was not framed within what was understood about the paranormal because of the cultural barriers and inconclusive research that surround the paranormal.

The operating definition incorporated many of the ideas that have been mentioned in this chapter thus far, especially those of Agor (1989) and Berry (1987). This definition considered implicit knowledge to be that something else which people use to make decisions. Furthermore, it considered implicit knowledge to be a form of knowledge that an individual uses to make a decision; that is derived from knowledge that once was declarative or was acquired through an implicit learning process; and that is not easily accessible to conscious awareness or easily taught. A portion of implicit knowledge is considered to be impossible to detect, while the remainder can be detected using elicitation techniques. In this study, the detection of implicit knowledge does not suggest that it can be formalized or made accurately explicit; at best, an implicit knowledge experience can be detected and delineated in its contextual situation.

Development of Specific Research Questions

To explore the research question, six specific research questions were developed as the study unfolded. For example, when respondents were asked if they kept the employment of unconscious knowledge a secret, information was gathered that was classified in more than one theme or related to the specific research question on elicitation. In other words, the information was applicable to one or more of the specific research questions. In brief, five of the specific research questions related to the themes (structure, function, context, enhancement, and meaning) and one related to the elicitation of implicit knowledge.

Framework

The focus of this study was to gain insights into the nature of implicit knowledge of senior secondary school principals. Information related to the research question was elicited from five school principals in their current positions and in reference to the operating definition of implicit knowledge. The operating definition was not imposed on the respondents. The intent of the study was not to formalize the principals' implicit knowledge experiences, rather it was to detect and delineate them in each respondent's contextual situation.

The literature review was used by the investigator, early in the study, to develop the framework. The framework was a flexible guide for conducting the study rather than a rigid script. The interview questions were developed and refined, and probing questions emerged as the study unfolded. Themes emerged and the specific research questions were developed as the data collection and analysis were conducted.

The elicitation technique used to gather the majority of information was that of semi-structured, in-depth interviews (see Appendix A for the Preliminary Interview Guide). Other information came from a running commentary and documentation. The information collected was analyzed for patterns and these patterns were interpreted within each principal's contextual situation.

Findings that related to the five themes were compared to the literature. The investigator's assessment of the elicitation techniques employed in the study was done in light of what was stated in the literature. Furthermore, the definition of implicit knowledge held up during the study.

Summary

The investigator reviewed literature related to implicit knowledge and its elicitation. Studies in the field of educational administration were limited. Studies conducted in related fields were reviewed, namely those associated with the computer and cognitive sciences. From a review of the literature, an operating definition of implicit knowledge was formulated and elicitation techniques were selected.

From a synthesis of the literature, the investigator concluded that implicit knowledge could be detected and delineated. Interviews and running commentaries were found to be established techniques that proved valuable in eliciting implicit knowledge. Problems associated with the elicitation of knowledge were considered to be of little consequence for this study as a result of the nature of the research question.

The literature review was also used to develop the study's framework, to refine the specific research questions, and to conceptualize implicit knowledge so as to analyze the study's findings. Furthermore, the review was useful in developing the study's research design.

CHAPTER 3

Research Methodology

Introduction

Outlined in this chapter is the mode of inquiry which formed the basis for the research methodology of this study. The mode adopted was from the interpretive perspective. Also outlined in this chapter are discussions related to the research design: selection of respondents, data collection, data analysis, overview of the themes, and trustworthiness. A discussion on the study's ethical considerations appears at the end of the chapter.

Interpretive Perspective

The focus of this study was to explore the nature of implicit knowledge by interpreting the descriptions and comments of five senior secondary school principals regarding their implicit knowledge experiences in administering their assigned school. This exploration necessitated a mode of inquiry from the interpretive perspective rather than a positivistic one.

The interpretive perspective, also referred to as naturalistic inquiry (Lincoln & Guba, 1985), which includes symbolic interactionism (Berg, 1989), evolved through disciplines related to the social sciences, such as anthropology and sociology. In an attempt to explore the research question the investigator collected data during interviews. The data collected were relevant to each respondent's contextual situation. Through processes of data collection and analysis methods that are commonly associated with the interpretive perspective, the investigator interpreted the experiences that the respondents described. Since many of these experiences were selected or defined by the respondents, the theory of symbolic interactionism was pertinent to this study. Berg stated that "symbolic interactionism emphasizes social interactions (action with symbolic meaning), negotiation of definitions, and empathic role-taking between humans"

(p. 8). Moreover, as Lincoln and Guba pointed out, when the interpretive investigator explores any phenomenon there is a wholistic approach which has its foundation in five axioms. They stated that the five axioms (which include assumptions about ontology, epistemology, truth, causality, and axiology) are "crucial to an understanding of the naturalistic paradigm [interpretive perspective]" (p. 36).

The first axiom, ontology, refers to "the nature of reality" (Lincoln & Guba, 1985, p. 37). Lincoln and Guba claimed that for an investigator realities are multiple and constructed. In other words, insights into the research question are obtained that are not possible through fragmented and single realities associated with the positivistic perspective. The epistemology axiom refers to "the relationship of knower to the known" (Lincoln & Guba, 1985, p. 37). An investigator and respondent are considered inseparable and their relationship interactive. In this study, the relationship between the investigator and each respondent was developed throughout the data collection and analysis. Statements of truth are bound by time and context, including each respondent's contextual situation. The aim of an investigator is to develop "'working hypotheses' that describe the individual case" (Lincoln & Guba, 1985, p. 38). Moreover, the aim of this investigator was to develop "an idiographic body of knowledge" (Lincoln & Guba, 1985, p. 38) based upon each respondent's experiences. Determining causality from the interpretive perspective is impossible. "All entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effects" (Lincoln & Guba, 1985, p. 37). From the data collected and analyzed, the investigator inferred explanations based upon a wholistic view of events related to the research question. The fifth axiom, axiology or "the role of values in inquiry" (Lincoln & Guba, 1985, p. 38), relates to the value-bound nature of the interpretive perspective. From this perspective, this study is considered to be value-bound by the investigator; by the choice of paradigm or perspective; by the framework (instead of theory) utilized in the study; and by the context (meaning the respondent's situation, the nature of the settings, the non-verbal clues given during the data collection process, the respondents' relationships with colleagues, and so forth).

The research design of interpretive studies differs greatly from controlled experimental studies that are associated with a positivistic perspective. The interpretive tradition was considered appropriate for this study due to the indeterminate nature of the research question. The investigator determined the best method to begin the study. Saturation (Glaser & Strauss, 1967) and redundancy (Lincoln & Guba, 1985) of information were used as indexes for deciding upon the size and length of the study. The investigator did not seek out predictions to the research question. Instead, the investigator gained insights through the interpretations of data elicited primarily through semi-structured, in-depth interviews. Lincoln and Guba considered such a study to have an emergent research design.

Research Design

The research design unfolded with the study. The specific research questions were developed as the study was conducted and five of the questions paralleled the themes that emerged. The majority of information relating to the themes was elicited through interviews. Preliminary interview questions were used as a guide and other questions developed as the interviews were conducted.

Information elicited from each respondent was transcribed and analyzed in relation to each principal's contextual situation. The investigator endeavored to assume the role of each respondent, and was aware of and sensitive to the role of "human-as-instrument" (Lincoln & Guba, 1985, pp. 192-195). Initially, the content analysis of the transcripts focused upon each of the respondents. The focus then moved to a collective perspective where themes became apparent.

The reporting of this study in a thematic format was deemed most appropriate because of the exploratory nature of the research question. This format, which parallels the intent of biography as described by Nadel (1984), "is not so much to convey the 'facts', which it linguistically cannot do objectively, but to present an attitude, perspective or point of view regarding those 'facts'" (p. 208). The information elicited from the five respondents, or five case studies, and used in reporting the themes provided a wealth of information. Furthermore, as Lincoln and Guba (1985) pointed out, which is in keeping with Yin (1984) and Berger and Luckmann (1967), case studies are more adapted to multiple realities because they lend themselves to presenting the investigator's role in the study, naturalistic generalizations, thick descriptions, mutual shaping influences, and value-bound factors. Lincoln and Guba suggested that a purposive sample of respondents be used to capture "the full array of multiple realities" (p. 40).

Selection of Respondents

The five respondents of this study were selected from a purposive sample of school principals based upon reputation, the school level that they administered (namely senior secondary--grades 10-12), and geographic location of the school (namely rural and suburban). The five respondents came from the same region of a province in western Canada.

To assist in maximizing the realm of realities, the investigator felt that selecting principals from a cross section of school districts was more appropriate than one school district (namely urban). School level and geographic location appeared to adequately address the requirement that the implicit knowledge literature suggested in regards to respondents being from similar domains (Berry, 1987;

Polanyi, 1966). Five respondents were chosen because the investigator considered this an appropriate number for a quality study based upon the available resources and the results of a pilot study (the investigator was prepared to select more than five respondents if deemed essential). The respondents were chosen from a list of 10 candidates who were considered to be candid and articulate. All 10 candidates were male. Based upon resources, no female senior secondary principals were available in the vicinity of the study. The list was compiled with the assistance of practicing school administrators, and educational administration professors familiar with the principalship of the region where the study was conducted.

Initial contact with each respondent was made by telephone, and an explanation of the study was given. During this conversation candidates were asked if they were willing to participate. During the first interview, respondents were asked to sign an acknowledgment form (see Appendix B) indicating their willingness to participate. The first five candidates contacted readily agreed to partake in the study because, as will become evident in the following chapters, the research question interested them.

Data Collection

To achieve an understanding of the nature of implicit knowledge of senior secondary school principals, the investigator elicited data mainly through semi-structured, in-depth interviews. Respondents were required to be reflective and introspective. Other data were obtained using running commentaries of respondents in a problem-solving situation (see case study in Appendix C), from related documentation, and from the investigator's journal and notes. The proposal for this study included receiving respondents' journal notes of thoughts related to the research question. Each respondent indicated that he was unable to fulfill this request because of time constraints. Results of a pilot study were also used in the reporting of this study's findings and were useful in the early stages of data collection and analysis. Analyses were conducted as data were collected from each interview.

Interviews. Three semi-structured, in-depth interviews were held with each respondent. The length of each interview ranged from one to two hours. In the case of one respondent, Paul, one of his interviews came from the pilot study. Each interview was transcribed verbatim. As the study progressed the investigator was able to, as Lincoln and Guba (1985) suggested, find patterns emerging. Such redundancy provided confidence in the interpretation of the transcripts.

The interviews were designed to encourage the principals to relate their various experiences that involved implicit knowledge. The questions (see Appendix A) used in the interviews were based upon Agor's (1986b) questionnaire on administrators' abilities, in a variety of fields, to employ intuition when making key decisions. The five respondents were probed for details, and other questions arose as the data were analyzed. A telephone follow-up interview was held with one respondent to clarify information.

As part of the member check portion of trustworthiness, each respondent was given the opportunity to assess the accuracy of the data collected by reading the transcripts (see letter in Appendix D). The investigator made grammatical corrections to the transcripts. Respondents were encouraged to provide additional information for clarity and detail. In general, the data collected were accurate and no new information was provided. At the end of this member check process, personalized letters were sent to the respondents thanking them for their participation in the study.

Pilot study. A pilot study of the interview questions was conducted with six principals (two females and four males) from all school levels and who were enrolled in the graduate program in the Department of Educational

Administration at the University of Alberta. As mentioned, one of the pilot participants was also one of the study's five respondents. The pilot results assisted the investigator to determine the length of response time for each question and to ascertain some idea as to what to expect as replies. Specifically, the results showed that the term implicit knowledge had a wide variety of conceptualizations. (As a result, the term unconscious knowledge, a more general construct, was used initially with the study's five respondents so that the definition of implicit knowledge was not imposed upon them.) The investigator concluded that the pilot participants found the research question interesting and of potential value. Furthermore, the pilot results were found to be a useful source of information for assisting in reporting the study's findings.

Running commentary. Berry (1987), Johnson (1983), and Sharman and Kendall (1988) indicated that administrators may have difficulty explaining how they arrived at a decision. They suggested that running commentaries be used as a technique by which respondents provide the relevant attributes influencing a decision in a problem-solving situation. If the respondents are unable to provide the attributes, the investigator can then probe for details. For this purpose, a case study was compiled (see Appendix C) and given to the five respondents in the third interview session. An analysis of the commentaries enabled the investigator to identify those areas of thinking or action that appeared to be rooted in implicit knowledge. A limited amount of new information was elicited through the commentaries. More important, the analysis indicated a consistency with the interview data.

Documentation. The respondents were asked to volunteer documentation that was applicable to their implicit knowledge experiences. Such documentation included handbooks, staff meeting minutes, office diaries, and personal files. In three instances with one respondent, personal files assisted him in recalling certain events. The documentation sources were also used to establish credibility; that is, the information elicited during the interviews was in keeping with the documentation.

Investigator's journal and notes. The investigator maintained a journal and detailed notes for personal research purposes and for, as Lincoln and Guba (1985) suggested, establishing trustworthiness. The journal and notes contained information, impressions, and comments on all facets of the study. The journal was found particularly helpful with the data analysis.

Data Analysis

Data came from the transcripts, the respondents' commentaries, documentation, and the investigator's journal and notes. The actual data analysis was determined as the study was conducted. The investigator found the data from the commentaries and documentation useful for verifying the interview data. In this study, as Lincoln and Guba (1985) claimed, the investigator's journal and notes assisted with any analysis that occurred as the raw data were collected. As a related side note, what occurred in these analyses was itself rooted in the implicit knowledge of the investigator. This is in keeping with comments by Berg (1989) and Lincoln and Guba that claimed that the investigator uses implicit or tacit knowledge in research.

As data were collected from all sources, they were immediately analyzed for patterns. These analyses served as initial impressions or interpretations, from which the themes emerged. This activity rendered assistance in reducing large amounts of data to a manageable level. The data analysis was also comprised of "an interpretive reading of symbolism underlying the physically presented data" (Berg, 1989, p. 107).

Processing data. Transcripts were made immediately after each interview and an analysis of these were completed. This task permitted the investigator to summarize and refresh a respondent's memory of what was said in a previous interview. Furthermore, such a task assisted the investigator in assessing the respondents' conceptualization of terms and their understanding of a particular question.

The investigator was able to use the transcripts for maximizing the efficiency of the the data analysis. The format of the transcripts was set up to provide sufficient space for note making. Cross referencing was conducted through the use of copies. As the data were analyzed, a decision was made as to the coding procedure that would be employed for determining patterns for the interpretations. This processing method assisted the investigator to assess the data for redundancy and saturation. The various stages of the data processing were contemplated and refined in the investigator's journal and notes.

Berg (1989) outlined seven elements for coding: "words or terms, themes, characters, paragraphs, items, concepts, and semantics" (p. 112). Berg (1989) further suggested an eighth as the "combination of elements" (p. 113). Coding in this study was conducted through his eighth suggestion, a combining of the elements. The investigator further found that Berg's (1989) "theoretical classes" (p. 116) were useful, as were "common [everyday] classes" or "special [member] classes" (p. 116). In addition, open coding, as outlined by Berg (1989), was employed, especially in the early stages of content analysis. The investigator gradually took the patterns from the transcript of a respondent to abstract terms and used them in a collective perspective for reporting the study's findings. Through discussions with another individual, the final themes were delineated. Near the end of the data analysis the investigator began to layout the respondents' descriptions and comments as they related to the final themes. This information assisted in determining the credibility of interpretations.

Referencing scheme. The five sets of transcribed interviews, the documentation, and the investigator's journal and notes constituted the data for this study. Each set produced between 85 and 115 pages. The referencing scheme was used in the data analysis and for quoting information in the reporting of this study. The scheme was comprised of the first letter of a respondent's pseudonym (Bill, Fred, Gerry, Paul, and Tom); by the interview session (1, 2, and 3); and by the page number of the transcript for the interview session (see Appendix E for details). The format of each set of transcripts was changed for the member check, reducing the pages to between 36 and 53.

Documentation such as resumes, newspaper clippings, personal files, and school handbooks varied in length from under a page to 100 pages. The investigator's journal and notes were comprised of approximately 200 pages. Since the information from these sources was not quoted in this study, a referencing scheme was not necessary.

The final themes, as well as the specific research question on elicitation, were analyzed with what was uncovered in the on-going literature review.

Overview of the Themes

Information elicited from the respondents and the investigator's interpretations were captured in five themes. The themes that emerged were labelled structure, function, context, enhancement, and meaning. The use of the word theme in this study differs from Berg's (1989) use of "a simple sentence" (p. 112). A theme for the purpose of reporting in this study refers to the delineation of particular subject or topic. According to Eldridge and Crombie (1974) and Lincoln and Guba (1985), themes form a typology scheme of sorts. The typology that emerged in this study was useful for discussing the study's findings. By no means can this typology be considered complete because the five themes were based upon the contextual situations of the respondents.

The first theme, structure, emerged from information that the respondents provided regarding the form and shape of implicit knowledge. The functional theme encompasses the operational dimensions of implicit knowledge. The theme of context depicts the areas of administration where implicit knowledge was employed. The fourth theme, enhancement, illustrates what respondents do consciously or unconsciously to improve their use of implicit knowledge. The theme of meaning gives an account of how the respondents react to their use of implicit knowledge on the job.

Trustworthiness

Trustworthiness is related to the data collection and analysis techniques employed in an interpretative study. Lincoln and Guba (1985) suggested that to show trustworthiness and authenticity of the data, credibility, transferability, dependability, and confirmability must be established. Credibility of the interpretations and findings was established through prolonged engagement and triangulation; peer debriefing; negative case analysis; and member checking. Engagement occurred with the respondents over a two to three month period. This was sufficient time to build trust and to allow the investigator to reflect between interviews. Triangulation involved the use of the running commentaries and the multiple sources of documentation. Peer debriefing took place constantly through the data collection and the audit. Negative case analysis was established in the interviews. As mentioned earlier, member checking occurred during the interviews and through a reading of the transcripts. Transferability was provided through "thick description" (Lincoln & Guba, 1985, p. 316) in reporting the study's findings so that the reader can assess whether transfer to other contextual situations is possible by the descriptions and interpretations that had been provided. Dependability was established through an external audit of the study's process and product.

Confirmability was established through the audit trail of the raw data, transcripts, coding and categorizing of that data, theme development, and the investigator's journals and notes.

Ethical Considerations

The respondents were informed by telephone that their participation was voluntary, that they could opt out of the study at any time, and that all responses would remain confidential. The last two items were reinforced in the acknowledgment form (see Appendix B). Individuals involved in the selection of potential respondents were informed that their participation was voluntary and that their responses would remain confidential.

In the study, references to the specific positions of individuals were made in generic terms. To further ensure confidentiality, respondents, schools, and other people named during the interviews were given pseudonyms.

Summary

The investigator explored the nature of implicit knowledge of senior secondary school principals by interpreting the descriptions and comments which practicing administrators made about their implicit knowledge experiences. An interpretive study, based on the axioms of naturalistic inquiry, was deemed appropriate for developing the research design.

Data for this study were collected from five male senior secondary school principals. Three in-depth interviews were conducted with each principal and other necessary data in the form of documentation were provided by the respondents.

Data analysis was carried out during the data collection. The content from each interview was interpreted, followed by an interpretation from a collective perspective; from this emerged the five themes that were used to discuss the research question and information regarding the elicitation of implicit knowledge.

CHAPTER 4

Background

Introduction

This chapter will provide the reader with a brief biographical sketch of each respondent and a description of the school that each administered during the interviews. The investigator used this information to discuss the data elicited from Bill, Fred, Gerry, Paul, and Tom in their respective contextual situations. The descriptions of the schools are intended to provide the reader with information regarding the setting in which each respondent worked. The purpose of the biographical sketches are to give a historical account of individuals' experiences that have relevance to the research question.

School Settings and Biographies

All the respondents were principals of public senior secondary schools. Each school had other features that were similar with one or more of the other schools, as well as its own unique features. The descriptions that follow were compiled from depictions supplied by each respondent during the interviews and from information that appeared in school handbooks and other school documentation.

Unlike the school settings, common features amongst the respondents were less apparent. The respondents' career experiences were diverse. Their academic and work experiences were similar in that the respondents had taken courses beyond the undergraduate level and each had additional administrative or management experience in education or other areas. The five biographical sketches that follow were compiled from information elicited during the interviews and from curriculum vitaes supplied by the respondents.

Bill's Background

School. The school that Bill Wallace administered was Mowat Senior Secondary School. It had two assistant principals and approximately 1,000 students and 50 full-time equivalent teaching staff. The economic status of the school's community was described by Bill as being middle to high, with 40% of the student population coming from homes that were situated on acreages of various sizes. Bill considered the school to be unique from other senior highs because the students identified the school by its name rather than a particular community or geographic location. Mowat was in an area that could be described as rural-suburban.

Mowat students scored consistently higher than average on provincial examinations in Mathematics and Science. Bill viewed the staff as stable, especially in the Mathematics and English Departments. He further pointed out that the staff made an effort to change their classroom instruction, according to assessment results, so that excellence was achieved. Course offerings at Mowat were broad. Bill felt that Mowat's extra-curricular program was good and that a willingness to sponsor extra-curricular activities was an important consideration in hiring new staff members.

Biography. Bill, an active runner, had been the principal at Mowat Senior Secondary for 13 years. He had eight additional years of experience as a principal in other schools of varying grade levels in two provinces--Bill was never an assistant principal. In addition to Bill's educational administrative experience, he had four years teaching experience.

Bill was in his early sixties when the interviews were conducted. He was planning his retirement and found his 25 years of experience as an educator to be fulfilling and exciting. Prior to entering the profession, Bill worked on a science degree while farming. Bill received his first teaching assignment before he completed his degree and teacher education. After completing these, Bill went on to complete a master's degree in education.

Bill's administrative and management experience outside of the principalship extended into his earlier days on the farm and in a family business. Bill was also active in different capacities in the political arena. He felt these experiences had helped him in his years as principal at Mowat.

Bill's educational administrative experience further included, to name a few, making numerous presentations at conferences; being actively involved in principals' organizations; being a founding member of several educational organizations; working with the provincial teachers' association; and having a variety of responsibilities on a multitude of different planning committees for the school board and teachers' association. Bill acknowledged that the staff at Mowat Senior Secondary thought that "the school may pay a price" (B1: 3) for his intense professional involvement. He felt, however, that the concern was minimal; so he never consciously reduced the extent of his involvement. Bill suggested he was able to comfortably handle any deep personal concerns he had in regard to this issue.

Fred's Background

School. Fred Palmer was principal of Livesay Senior Secondary School. The school had an enrollment of approximately 1300 students and consisted of an estimated 70 full-time equivalent teaching staff. There were three assistant principals at Livesay. Fred described the economic status of the suburban community as being in the middle range with its population having upwardly mobile aspirations. Livesay had the largest student population of the schools administered by the respondents. The school was built in the late 1960s. Fred claimed that during the school's early history it was considered to have a free-wheeling tradition, which he suggested was not unique for schools in those times. Over the years, Fred watched what he described as a slow tightening of various provincial, school district, and school regulations. He viewed this shift in regulations to be the norm with other high schools in the province.

Livesay students were described by Fred as being largely academic, and he emphasized that the staff saw themselves as being more effective with academic students than with non-academic ones. Students with severe learning problems normally attended a neighboring school. Livesay students scored above average on provincial examinations and were considered strong in the Arts. Course offerings at Livesay were diverse. Students and staff were recognized for their efforts and performances in extra-curricular activities.

Biography. Fred had been administering Livesay Senior Secondary for seven years. He had spent two years as a principal at another school and four years as an assistant principal at Livesay. Fred's educational experience spanned approximately 30 years. He had spent 18 of those years teaching mostly Mathematics, Science, and Physical Education. He had also spent five years as an instructor at two different teachers' colleges outside of Canada.

When the interviews were conducted, Fred was in his mid-fifties. He began teaching at the high school level after obtaining his Bachelor of Science. He received his teacher education while teaching. Before being appointed to his assistant principal position, Fred enrolled in, and later completed, a graduate diploma program in educational administration.

Fred had considerable experience in related professional activities. Prior to becoming an administrator, he had approximately five years of experience as a subject coordinator in two different schools. He had spent the last 20 years involved in over 10 local and provincial teachers' association committees. In two of the local committees he had held chair positions. The areas of concern of these committees had included legal and economic issues, bargaining, accreditation, class size, and employee benefits. Fred's experience in the local principals' association was also expansive and included chairing three different subcommittees (e.g., elementary, junior high, etc.).

Fred had related administrative experience which came from his involvement with various community organizations. He had spent a considerable amount of time in sports related activities at the school level and in the community.

Gerry's Background

School. Gerry Wilson administered Munro Senior Secondary School. Munro had approximately 1,000 students and 50 full-time equivalent staff. There was one assistant principal at the school. The school was situated in an agricultural-based community. The economic status of the community was considered by Gerry to be in the lower-middle range. The community had been established in the late 1800s and in the last 15 years had transformed from a farm to a rural-suburban community. As the community grew, more students began to attend post-secondary schools and academic results increased accordingly.

At the time of this study, Munro students performed average on provincial examinations. In conjunction, students had received numerous awards in academic related extra-curricular activities such as debating. Other awards were given in sports competitions. Gerry considered the greatest strength of the staff to be their team effort and he felt that students had "nice kinds of attitudes" (G1: 1).

Biography. Gerry had been the principal at Munro Senior Secondary for 10 years. He had no other administrative school experience. In total, Gerry has been an educator in the province for 22 years.

Gerry was in his early fifties when the study was conducted. Upon finishing high school, Gerry had worked on oil rigs and had entered the Air Force for five years. After the Air Force, and prior to entering university, he had worked for the telephone company for three years. He claimed that these jobs required little administrative and management skills. He received a Bachelor of Education and went on to become a classroom teacher. A few years ago, Gerry pursued a master's degree in educational administration and completed a number of the program's courses. During the program, Gerry fell ill. The illness took him away from his graduate studies for what he considered to be such a long period of time that he lost his desire to complete the degree.

In comparison to the other respondents, Gerry's educational administrative and related professional experiences can be considered limited. For the most part, Gerry was shy about giving presentations but had occasionally done so to various educational organizations and at educational conferences. He had had some related professional experience with the provincial teachers' association's economic and negotiation committees and had served as a chairperson on related subcommittees. In addition to his professional experience, Gerry managed a small business enterprise in the rural-suburban community where Munro is located. Gerry considered this experience to be useful in his principalship; especially with financial matters and public relations issues.

Paul's Background

School. Paul Robins administered Gustafson Senior Secondary School. There was one assistant principal at the school. Gustafson had approximately 600 students and 30 full-time equivalent staff. This school had the smallest student population of the schools administered by the respondents. Paul considered the community to have an agricultural base and an economic status in the middle range. More specifically, he suggested that the community was much like the suburban communities of the 1960s. Based on Paul's descriptions, the community could be considered more rural than other school communities reported in this study.

Paul pointed out that a large portion of the Gustafson staff had a considerable amount of teaching experience and that staff turnover was low. Students at Gustafson achieved average results on the provincial examinations. Considering the size of the school, Gustafson's academic, non-academic, and extra-curricular programs were diverse. Paul claimed that the school's band and physical education programs were generally recognized by other schools as outstanding. He further mentioned that the community valued education and was supportive of the school's programs. Paul described students as good students who were willing to try things and pointed out that this small school performed well against their larger counterparts in several extra-curricular competitions.

Biography. Paul had been the principal at Gustafson Senior Secondary for four years. A year prior to this position, he was the assistant principal at Gustafson. Early on in his 18 year educational career, which included teaching most grade levels, Paul was the principal at another school in the same school district.

Paul was in his early to mid-forties when he was interviewed for the study. He was the youngest of the five respondents. During Paul's high school days and before graduating with a bachelor's degree in education, Paul was highly involved in sporting and music activities which took him into provincial, national, and international competitions. He had completed a graduate diploma in educational administration and was, at the time of the interviews, finishing a master's degree in the same field. Paul did mention that he had aspirations to pursue a doctorate in educational administration.

Just prior to the halfway point of his educational career, Paul extended his administrative and management experience for a two year period in the business and government arenas. For a short time, he was a consultant for a natural resource company. He spent the remainder of the two years as an executive assistant in the provincial legislature.

Paul's experience in the field of education was expansive. He had had extensive coaching experience. Further, Paul also had educational publishing experience as an author, a contributing editor, and a consultant. Paul had conducted a number of workshops which included a focus on curriculum and administrative matters. Committee work had included activities at the school, local, and provincial levels for school boards, the teachers' association (local and provincial), and the ministry of education. This work had included concerns revolving around curriculum, student evaluation and assessment, school administration, provincial educational development, and policy issues, to name a few.

Tom's Background

School. Tom Dunlop was principal at Pratt Senior Secondary School. There was one assistant principal at this school. Pratt had an enrollment of approximately 800 students and an estimated 40 full-time equivalent staff. Tom considered the suburban community to have an economic status in the upper-middle range. The school could be characterized as having an academic orientation with 95% of the students going on to post-secondary school. The community had a long history and had a number of population growth spurts over the decades.

Tom felt the community was highly supportive and that the staff was comprised of "top quality educators" (T1: 3). Students at Pratt scored above average on all provincial examinations and had particular strengths in Mathematics and Science. The school had diverse academic, non-academic, and extra-curricular programs. Tom stated that new students attending Pratt felt that the school was a "caring place" (T1: 4).

Biography. Tom was in his third year as principal at Pratt Senior Secondary. He had been a principal of two other schools in the province; for two years at one school, and one year at the other. Tom's educational experience at the elementary and secondary levels included one year as an assistant principal, two years as a counsellor, and 10 years as a teacher.

Tom was 50 years of age when he participated in the study. He taught for a year after receiving his teacher education and returned to university for two years to complete his Bachelor of Education. After receiving the degree, Tom taught for three years at the elementary level and then taught for two years at a correctional institute. He then went on and filled administrative positions, twice as a supervisor and once as a superintendent, at three different correctional institutions over a six year period. Upon returning to the secondary educational system, Tom completed a diploma program in educational administration.

Tom had a limited amount of experience with professional associations. He had business experience in addition to his administrative experience. When he returned to education he owned and operated a small business. Tom closed the business six years ago. He stated that many of the skills he learned in the business world were useful in the principalship.

Tom played golf and spent as much time as possible coaching school and community teams. He was actively involved in community organizations and had chaired several committees related to these organizations.

Summary

The respondents and their respective schools had a number of similarities as well as dissimilarities. This chapter highlighted the special features of each school and the relevant experiences of each respondent.

The populations of the schools ranged from 600 to 1,300 students. The schools' communities were described by the respondents as being supportive and as having economic statuses that ranged from lower middle to upper middle. These communities were located in areas that could be described as agricultural, rural, suburban, or some combination. None of the schools' communities were described as urban. For the most part, the staffs and students worked together to achieve academic results that were average or better. Furthermore, staffs and students appeared to work as hard at extra-curricular activities as they did with curricular activities.

The five respondents had a wide range of experiences in and out of the field of education. All had completed graduate courses, a diploma, or a master's degree. The respondents had been in their current positions for a three to 13 year period. All respondents but Gerry had additional educational administrative experience, ranging from one to eight years. The teaching experiences of each respondent ranged from four to 18 years. All the respondents had other administrative or management experience in areas outside of educational administration including the business world, government, or teachers' (and other) associations or organizations.

CHAPTER 5

The Structure of Implicit Knowledge

Introduction

In this chapter the reader is provided with a brief discussion of the problems associated with describing the structure of implicit knowledge experiences. The remainder of the chapter reports the findings from the study that were used to develop the structural theme. The chapter ends with a discussion of the findings.

The Search for Structural Cues

Implicit knowledge, according to this study's conceptualization of the term, is difficult and at times impossible to formalize into a set of rules. Moreover, detecting phenomena involving implicit knowledge is debatable. Various analogies were used by Agor (1986b) and Goldberg (1983) to make this point in their examinations of intuition. Two analogies that would be applicable to this study are: one, seeking agreement to what is beauty; and two, how the word love is applied. In short, beauty is left in the "eye of the beholder" and love can be considered attraction, affection, or lust, to name a few.

What needs to be kept in mind with implicit knowledge are two ideas which parallel these analogies and which are derived from this study's conceptualization of implicit knowledge. One, the operational definition takes into consideration the ambiguity and vagueness that is associated with implicit knowledge and which encompasses the problems of its elicitation. Two, the final assessment of what constitutes an implicit knowledge experience is arbitrary. The ultimate detection or recognition of an experience is dependent upon the investigator's interpretations and the trustworthiness that is employed.

A review of the literature indicated that there are forms and shapes to implicit knowledge experiences. This study used the term structure to categorize the forms and shapes. Knowledge which was truly implicit, that is it could not be elicited, would have been of interest to this study if it could have been detected; however, because of its very nature, it was of no consequence. The other two types of elicitable implicit knowledge, that which was declarative at one time or that which was acquired through an implicit learning process, were paramount.

Initially, this study was not intended to examine the structure of implicit knowledge. As the transcripts from the pilot were analyzed, the investigator found that the pilot participants mentioned cues that gave form and shape to their experiences. Many of these structural cues also appeared in the transcripts of the respondents.

Vaughan (1989) described intuitive experiences in terms of levels and Goldberg (1983) wrote about modalities. Such constructs are appropriate for reporting ideal types, which are more suitable for positivistic studies of implicit knowledge. In this interpretive study, these constructs were useful to the extent that they assisted the investigator in the preliminary exploration of the structure of implicit knowledge experiences. An early content analysis of the transcripts indicated that the respondents provided cues connected to the structure of their implicit knowledge experiences. As the study progressed, the investigator interpreted others. Moreover, some respondents were able to provide details or specifics to particular experiences, thus making the cues more easily identifiable.

Implicit Knowledge Cues

The respondents were asked a series of semi-structured questions regarding how they made decisions. They were asked first to explain "how they go about employing knowledge to make their most important decisions?" (Note, the question did not specify the type of knowledge.) They were further asked, if necessary, how they determined if a particular decision was right or wrong; they were also asked to supply examples and specific factors about themselves and their surroundings that existed with these decisions. The investigator then probed for, if necessary, what was termed the use of unconscious knowledge (see Appendix A).

All of the respondents provided information regarding the structure of their implicit knowledge experiences in their responses to the first two questions. Respondents were probed throughout the study with other questions, or some version of them, for more information. From this information emerged the structural cues which were categorized as generic, global, *déjà vu*, sensational, and metaphoric. Listed in Table 5-1 are samples of the structural cues associated with each category.

Generic Cues

The largest number of structural cues elicited from the respondents were categorized as generic. The terms used to describe the cues tended to be generic as oppossed to the details associated with the cues. In many cases, the investigator was unable to pinpoint whether these cues were physical or mental sensations, or another modality or level as discussed by Goldberg (1983) or Vaughan (1989). Many of the cues appeared to be related to a particular sensation or another category because of the words the respondents chose to describe an implicit knowledge experience; however, caution needs to be taken when determining if these relationships existed. There was no information that assisted the investigator in interpreting a particular generic cue outside this category.

On their own accord, the respondents provided limited information regarding the generic cues. Upon probing the respondents about some of these cues, further information was elicited. There is reason to suspect that this information was not the best possible descriptions of the cues. On the one hand, there may not have been any way for the respondents to provide more detail. In other words, the respondents may have been limited in communicating information related to the cues because of the restrictions associated with, for example, language or cultural barriers.

Table 5-1

A Sample of the Implicit Knowledge Cues Elicited From the Respondents

Category	Cues
Generic	-you just know -it felt right -a sense -something inside -a feeling -comfort -a fit -an impression -a gut feeling -it came to me -I just sensed that -a sense of excitement -a sense of what is important -I know, and I don't know
Global	-what I interpret to be -a sense of fair play . . . of the long term -you feed . . . [it] into the mix -create positive pictures . . . [of what] should be done
Déjà Vu	-informed intuition -I know your type -I've been here before -I have seen this before -doing something that you have done before -I've seen you guys before -I wish that I had done that . . . before

Table 5-1 (Continued)

Category	Cues
Sensational	-a voice inside -a mind voice -comfort/discomfort -a mental fit -in your heart -in [their] bone -the feeling is a rush (physical and mental) -excitement (physical or mental) -a picture in your mind . . . a visual image -a soft spot in my heart -gut is the right place to put it
Metaphoric	-family -scripting -team/coaching -peeling the layers -flipping a coin -like a [comfortable] shoe

To discuss each and every generic cue is a major undertaking. A sample of the generic cues does illustrate the development of the category and the diversity of the terms used. Bill spoke of making decisions "automatically" (B1: 25); having a sense of "trust" (B1: 13) in other people's thoughts or ideas; having "a sense of what is important" (B1: 18); "it felt right" (B2: 12); "certain things click in" (B2: 44); and "you [just] know" (B3: 9). Fred used words and phrases such as "a sense of what was important" (F1: 23); "the timing was right" (F1: 12); "I know, and I don't know" (F2: 39); and "something beyond what you might see on a resume sheet" (F2: 39). Gerry referred to that something else as being "automatic" (G3: 10); "what I think is or what I interpret to be" (G1: 3); what "I do . . . by nature, by accident, or unconsciously" (G1: 11); and "a sense of excitement" (G2: 17). Paul spoke of receiving an assortment of "clues" (P2: 22); "a sense" (P1: 12); feeling "strength" (P1: 2); "not [being] conscious of it" (P1: 1); and "something inside" (P2: 14). Tom used words and phrases such as "I just sensed that" (T2: 22); "I [just] knew" (T2: 9); "I _felt_ it" (T2: 8); "a _feeling_" (T2: 5); "that just hit me" (T2: 20); "I just sensed that" (T2: 22); "I feel very confident when the decision is good" (T2: 28); and "it came to me" (T3: 33). Besides these word and phrases, there were other generic cues that were accompanied by details or for which the investigator sought more information.

The respondents used the word "comfort" to describe part of their implicit knowledge experiences. Originally, Paul was unable to specify if this comfort was mental or physical (see the _Sensational Cues_ category for details). He did mention, in the first interview (pilot), that there was a strong feeling in assessing if there was enough information for making a decision. He indicated that the comfort feeling was part of the process: "A comfort feeling, a consensus feeling, a consistent feeling, or a feeling of

'Yea, I feel good about that'" (P1: 7). Bill also used the word comfort in reference to part of an assessment process. He spoke of a comfort feeling in relation to unconsciously approaching certain individuals for feedback regarding potential decisions; however, he was unable to relate the feeling to a particular sensation. Tom and Gerry talked about a comfort feeling and were also unable to associate it with a sensation. Upon probing, Gerry indicated a discomfort feeling which he claimed was physical (see the Sensational Cues category for details).

Although, Fred never used the word comfort, he spoke of impressions. He related an incident where he went to put his thoughts down on paper regarding a grade appeal by a student and found that what he experienced was more than what was on the paper.

> I didn't like what I saw. It just wasn't right for me. Somewhere in there it occurred to me that there was a way of doing this that was better. . . . It was then that I changed it. I don't know what happened. It just came to me. (F2: 9)

In deciding on a teaching assignment for a teacher, Gerry also spoke of impressions. He related it to feelings: "Well that whole exercise was not very factual business. I mean, it was a matter of impressions and, I guess, almost feelings about was happening rather than documentable kinds of stuff" (G2: 2-3).

The sense of feelings was expressed by many of the respondents in terms of a gut feeling. Often they were unable to specify if the gut feeling was in fact, as the term implies, a physical sensation. Other information associated with this generic cue was provided by the respondents. Bill claimed, "If I have a gut feeling, it is usually right" (B2: 36). Gerry, in working on a budget matter, agreed with the investigator's question that the gut feeling was a signal: "Oh, yea. That's it" (G1: 22). He stated that it was not necessarily physical; rather, "It is a sense of rightness, and the comfort level that I [Gerry] spoke of earlier" (G1: 22). Tom indicated that the gut feelings he received were also indicators for rightness. He suggested that they could also be indicators for wrongness: "I may have a gut feeling about it [a decision]. But I certainly won't pick one that I felt was wrong" (T1: 13). The sense of rightness that came through gut feelings was further described as a "fit."

The respondents spoke at length about knowing if the implicit knowledge they employed in their decisions was right or wrong by a sense of fit. This sense of fit was a personal perspective and was normally detached from a vision of the school. Bill told of an incident where he had to decide if he should place a certain science teacher in a senior level course. He said this about the teacher, "I just don't see you as a [senior level] Biology . . . teacher" (B2: 23). Bill added: "And that's implicit. I have never seen her teach [senior level] Biology . . .; I don't know [the] results. But, . . . like old Red Skelton said, 'You just don't look right to me'" (B2: 23). For Gerry, in regards to productive decisions: "Fit is every bit as important as making the decision. It wouldn't be productive if the fit wasn't there" (G1: 9). This sense of fit is Gerry's personal view of how the staff and community would perceive the decision. Tom, in commenting on the case study and the handling of Shawn, stated, "It would be based a lot on me as a person, how I view him, what I expect of him, and what my past experiences have been" (T3: 23). Paul was more specific as to what he meant by a sense of fit. He claimed that part of it involves "intuition" (P1: 6) and "is weighed in terms of rightness and wrongness" (P1: 6). Paul further explained that "there is a personal ethic that invades rightness, but there is a fit. There is a thing that you feel comfortable with, like a shoe" (P2: 7). The sense of fit, a personal and subjective perspective, was closely connected to global cues which were affiliated with the respondents' understandings of the schools they administered.

Global Cues

While global cues can be thought of as being affiliated with each specific school, they are also linked to the structure of implicit knowledge. Polanyi (1966) spoke of the ontological aspect of tacit knowing: that is, understanding of a comprehensive entity occurs by indwelling. The respondents demonstrated this aspect of tacit knowing in terms of the global cues that were elicited. Though this study did not go into detail as to what constituted each global understanding, including visions for the schools, the investigator did find that the respondents unconsciously employed what they perceived to be a global understanding of the schools they administered.

Gerry and Fred were the least specific of the respondents regarding the global cues. Gerry's lack of specifics still indicated that he made decisions based upon "what I [Gerry] think is, or what I interpret to be" (G1: 3) in relationship to stakeholders' concerns. Gerry later specified that it was an "automatic part of the process" (G3: 10) based upon his experiences at Munro Senior Secondary. Fred stated, "There is almost nothing that happens where you haven't been in similar situations" (F1: 4). He went on to say that in his decisions there is "a sense of fair play, trying to do what is right, or trying to see things in terms of the longer term rather than the immediate crisis" (F1: 5). To him this meant that a decision took into consideration all stakeholders rather than appeasing one group or one individual so as to get "out of the little bind that seems to have developed" (F1: 5). Fred's statement further indicated that he took into consideration what was best for Livesay Senior Secondary and the vision he held for the school.

The other three respondents provided extensive information related to global cues. Bill and Tom spoke of seeking information from people for assessing potential decisions. Bill indicated that what others have to say has to fit into the bigger picture for Mowat Senior Secondary. He emphasized that what others had to say were their perceptions. What he later explained was an implicit process: "You feed that all in, with your own impression . . ., and you get all of those into the mix" (B3: 13). Tom, a newcomer to Pratt Senior Secondary, claimed that he was "a visionary, fly-off the handle, idea, motivating type of individual" (T1: 18) who held a strong personal vision for the school. He suggested that the decisions he made were closely connected to "what I want to happen. . . . [,] where I want to go, and what I want to do" (T1: 28). Part of his decision-making process involved seeking feedback, particularly from the vice-principal, on potential decisions. He unconsciously approached the vice-principal because he had been at the school over 15 years and complemented Tom's skills. Tom described the vice-principal as "a very analytical, highly organized, meticulous person" (T1: 18) and felt Pratt Secondary had a "co-principalship" (T1: 17). Tom pointed out that he quit seeking information from others when he felt he had enough information and that the potential decision fit his vision for the school. He proposed that this was determined when he reached the comfort level.

Paul was the one respondent who provided details related to global cues. In reference to a quality school initiative, Paul claimed that he made decisions, in part, using knowledge linked to his vision for Gustafson Senior Secondary. Any decision made in this way was often done unconsciously. A strategy he used to assist in these decisions was similar to coaching a sports team. Paul declared that "it is a gestalt" (P3: 35). He claimed that he gave the staff, as he would a team or himself, the opportunity to build "an image, create positive pictures in their head[s] of what they have to do. Always doing it exactly the way that they know it should be done" (P3: 36).

Paul ascertained that this was something that was not taught to him.

> I have personally been doing that for almost 10 years. When I first started to talk about it, it was something that I realized I did but didn't know that I did. I sort of recognized that is what I had done. . . . It wasn't in an article I read or anything. (P3: 36)

Experiential, implicit processes were common among the respondents in reaching decisions. One such process which they mentioned was that of unconsciously using the knowledge of a previous decision in arriving at another decision. Structural descriptions for such phenomena paralleled, as Paul stated, "a sense of *déjà vu*" (P2: 3).

Déjà Vu Cues

All the respondents mentioned that experience in the school they administrated was important for reaching decisions. Many of the incidents that the respondents described involved decisions that paralleled decisions made at other times. Three of the respondents provided specific information related to *déjà vu* cues.

Bill spoke of informed intuition as coming from experience and felt: "It is something you have or don't have. I think it would be hard for some people to develop it" (B1: 16). Bill further explained that it was something he had: "I feel I have always had it. Maybe it is part of my upbringing. . . . I think it is intuition based on experience. I think that you hone it" (B1: 17). Bill also advised that there is a caution that goes with informed intuition.

> The difficult thing about experiences, is that you may jump to conclusions and say, "I've been here before. . . . I know your type; I've seen you guys before. . . ." That's a dangerous trap; you have to be very careful. Even though this situation seems to be walking in the same path, you may not be. (B2: 8-9)

Tom had something different to say about *déjà vu* cues and suggested they were signals.

> I probably . . . implicitly do things that I don't even know that I do because of all my experience. At the same time, that which I am conscious of . . ., because of my experience, [is] "Hold it, I've been here before. I better stop and think about this one." . . . I am not conscious of all that experience that I have had and how it has helped me to make the decision. . . . (T2: 19)

Paul often spoke of information related to *déjà vu* cues. On one occasion, while Paul walked around the school, a student exhibited uncommon behavior in the hallway. Paul claimed, she was not her usual self. Paul decided to approach her. The investigator asked Paul how he knew that it was the right time to approach her. He said: "I've been there. I've been there. There was a sense that I had been there. I sensed, within myself, that . . . I had done that lots of times before" (P2: 16). In other decisions Paul expressed similar feelings of *déjà vu*. In reference to determining if a decision was going to be right or wrong, Paul claimed:

> There is . . . a sense of *déjà vu*. . . . There is a sense that you are doing something that you have done before. At the same time it is different--the same but different. I don't think that you really know for sure, all the time, that it is right. (P2: 3)

Paul also emphasized that this sense of *déjà vu* was more than experience. He went on to explain:

> I think we make a lot of decisions and say, "Thank God, I was right." But I am not exactly sure how we arrived at that decision; sometimes, it is just there. I think the *is thereness* of that decision is probably a combination of things of which we are not really conscious. We see something and react to it out of a similarity thing; "I have seen this before." Something else happens and it fosters a kind of awareness. We then work our way through the solution knowing that these things are active without being consciously aware that they are active. So, it happens; it just happens. (P2: 4)

In probing, Paul provided further detail regarding the "something else" that happens. Paul stated that there "is a feeling about completeness, a feeling of accomplishment, or a feeling that you are using the resources that you have" (P2: 7).

Descriptions of implicit knowledge experiences of the respondents have thus far been discussed in relatively general terms; namely those associated with generic, global, and déjà vu cues. On occasion, they were fairly specific on how certain experiences were connected to particular sensations. Common forms and shapes of these experiecnes were often perceived and described by the respondents as being verbal, physical, and mental, or a combination of one or more.

Sensational Cues

One respondent mentioned an implicit knowledge experience coming specifically through a verbal sensation. Fred, when asked how he gauges honorable decisions, replied that the stakeholders of a decision are "treated with dignity and fairness" (F2: 3). He then went on to add that this is determined by a "voice inside" (F2: 4) him. In one incident where Fred described how he draws upon implicit knowledge, he mentioned writing his thoughts out. This visual aid helped to draw out what Fred alleged was "a mind voice" (F3: 10). He clarified that he does not sit and talk to himself, rather the implicit knowledge that eventually appeared on paper comes through this verbal sensation.

Physical sensations were fairly common but descriptions among the respondents varied. Information elicited using probing questions confirmed these to be physical sensations. Gerry indicated that for him difficult decisions brought about feelings of physical discomfort. He stated, "Having a physical signal, . . . is where you feel uncomfortable" (G1: 24). The physical signal was in reference to where he had to compromise what he felt was a right decision for a provincial or system policy. As well, Gerry claimed he received physical sensations of discomfort when there was a lack of information or no process in place to carry out a decision. For Bill, physical sensations were described in reference to risk taking where "you have to risk, and grow up and do things that you feel in your heart are the right things to do" (B1: 19-20). Fred also described physical sensations in terms of the heart when supervising teachers. He stated, "I have a soft spot in my heart for those people that can perform magic with kids" (F3: 37). Another example from Fred was in reference to what he believed constituted a good administrator; he admitted this applied to himself. Fred felt they could "sense" (F3: 8) problems and could arrive at decisions by "feeling it in . . . [their] bones" (F3: 8). Though these four examples could be interpreted as cliches or oversimplifications, other descriptions by the other two respondents seemed to indicate that some sensations were indeed vivid.

In describing what he meant by gut feeling, Tom stated: "Gut is the right place to put it. I feel it in the gut. . . . I really do" (T1: 20). In explaining his sense of comfort, Tom indicated that the sensation could be mental as well as physical. The best he could explain the sensation, physical as well as mental, was one of excitement. He said, "I get anxious. I get excited. . . . It is not only a mental state but a physical one" (T2: 27). Such descriptions indicated that the physical and mental sensations were closely connected. Similarly, in Paul's description of a fit feeling, he explained it as both physical and mental. The physical aspect of the sensation was for Paul a "sense of urgency" (P1: 4). Upon the investigator probing this comment, in conjunction with his comment regarding his sense of comfort, Paul stated:

> For me, it is like a visual image of seeing things the way they are; and then feeling either comfortable or uncomfortable, depending upon what you see in your picture. If you are suddenly in a focus that you don't want to be in, then sometimes you get uncomfortable. The [comfort] feeling is a rush. It is an adrenaline thing because you are up all the time. You are ready for whatever happens, but not physically, outwardly

ready. (P2: 23)

The mental sensations that were experienced by the respondents were difficult for them to express. In discussing a feeling of comfort, Gerry referred to this as a sensation that occurs in the mental state. When asked if the comfort feeling was a physical or mental sensation, he claimed that comfort "results in a mental comfort, not a physical comfort" (G1: 7-8). For Gerry, as mentioned, discomfort was a physical sensation. In a later interview, the mental sensation was described by him as "a sense of excitement. . . . It is an upbeat thing. Making a decision is a really upbeat thing. It sort of kicks things into gear" (G2: 17). For Tom, as mentioned earlier in this category, the feeling of comfort was both physical and mental. He claimed that the mental sensation that was accompanied by comfort, like Gerry, was one of excitement and anxiety.

> I'll tend to want to be the first to let people know about it [a decision], and as many as I can . . ., when I feel really good about a decision. I wasn't conscious of this as much before as I am now. (T2: 27)

Tom later explained that this excitement was connected to feeling "very confident when the decision is good" (T2: 28).

For Paul, like Tom and Gerry, sensations were both physical and mental. The physical sensations have already been mentioned. The mental ones for Paul consisted of a visual component. Paul claimed that the sensation was similar to the process of answering an examination question. He stated: "You know the answer--the confidence factor that appears there. That is accelerating intellectually because you know you're tapping a resource that has been fully mined, in the sense that you know that something is there" (P1: 3-4). The visual aspect was described by Paul, in reference to knowing that he has enough information to make a decision, as

> a picture in your mind, a drawing; a sense of completion--I have it figured out; "I know how this works"--a fit, a mental fit. You just know, you see it. It is almost like a puzzle, you put it together. For me, it is like a visual image of seeing things the way they are. . . . (P2: 22-23)

This visual image, which accompanies the mental sensation, was later equated to the process of scripting. "It is like writing or creating a picture; putting down all the things that I know about it, then wiping it off and redoing it" (P2: 33).

Another structural cue was related to metaphoric processes. These processes were detected through metaphoric cues.

Metaphoric Cues

Bill said that he used the family as a metaphor for administering Mowat Senior Secondary and indicated he used other metaphors; however, he was unable to communicate these. The other four respondents spoke at length, upon being probed, about the metaphors they used in administering their respective schools. Gerry stated that he used the family metaphor. Early in the interviews, he constantly related his experiences to making decisions in a family context. In the last interview he stated, "I actually refer to the school as a family" (G3: 3). He also added that he does this unconsciously, if not automatically, and definitely used other metaphors. Unfortunately, he was unable to identify these.

Tom indicated that he unconsciously used multiple metaphors for administering Pratt Senior Secondary. As examples, he used the team metaphor and claimed this may be because of his athletic background. He stated, "We set up a team and we have people who are better at some tasks than others, and we identify those" (T3: 14). The family metaphor was used by Tom to emphasize "loyalty" (T3: 14) with staff and students. He added, "We have to be aware that we are all important to each other and that we have an obligation to each other before anything else" (T3: 15).

Fred indicated that he unconsciously used metaphors. He stated: "I think it is too complicated to have just one metaphor. There are many metaphors. . . . I use them all the time, but I just can't think of one that doesn't sound silly" (F3: 27). In reference to determining if there was a missing link in a problem, Fred equated it to "peeling the layers" (F3: 20). Another metaphor that Fred used was that of flipping a coin. This was used when there was more than one solution for a decision. Fred emphasized that he did not really flip a coin. He said: "I never would. I couldn't do that" (F2: 41). Tom equated the coin flip to "an intuitive sense" (F2: 41). He indicated that what actually occurred was difficult to express. When probed for more information in regard to this metaphor, he stated: "It is very hard to articulate. . . . In most cases I find I don't have the words" (F2: 42).

Paul had more success at finding the words. As has been mentioned, he used the metaphor of scripting and the comfortable shoe. These specifically were in reference to an implicit process he employed. In reference to administering Gustafson Senior Secondary, he spoke of the coaching metaphor.

> One of the roles I play as an administrator is that of a coach of a team. . . . Everything I do with teams is intuitive: . . . reading people; putting people into a game in certain situations; and so forth. . . . I look at a situation--I don't have this grand scheme or game plan thing--and I just go with it. I go with whatever is happening. (P3: 34)

Paul cautioned that there is a difference between coaching a team and administering a school. With a team a coach tells a player what they will do, and players expect to be given strategies. Paul stated that in schools, "The idea of collegiality, team building, is far more important (P3: 39). Paul put a different twist to using metaphors, which other respondents did not mention. He said he unconsciously provided metaphors for others: "They are going to remember their metaphor, not mine. . . . 'Hey, if I can create a picture for them, they can see what I mean more clearly'" (P2: 31-32).

Discussion

An analysis of the information elicited from the respondents repeatedly showed that they each experienced a use of something else, besides that which was explicit, in their decisions. The use of that something else was detected through structural cues elicited from the respondents or interpreted by the investigator. Details of the cues were broad and indicated a structure to implicit knowledge. The structural cues varied among the respondents and in the incidents they described. Any commonness that existed was in the distinctiveness of the structural cues that were elicited.

The respondents, for the most part, provided information related to different structural cues through different incidents. In other words, the cues were respondent and context specific. Any similarity appeared to be based upon coincidence or a popular word chosen to describe the structure of an implicit knowledge experience. This study did not permit in-depth probes of similarities; however, the dissimilarities showed the range and scope of the structure of implicit knowledge experiences.

For the respondents to articulate the structure, or the forms and shapes, of their implicit knowledge experiences was difficult. Letting the respondents describe incidents of how they employed knowledge was deemed sufficient for detecting structural cues related to implicit knowledge. To gather details or specifics, it was necessary for the investigator to use probing questions.

The something else that was involved in the respondents' decisions were categorized as generic, global, _déjà vu_, sensational, and metaphoric cues in the structural theme. The difficulty associated with having respondents describe the form and shape of their implicit knowledge experiences was illustrated with the expansiveness of the examples from the generic category. With these cues, no link could be established with a particular sense or another cue. The global cues were related to an implicit process involving the respondents' global understandings, or bigger pictures, of the schools they administered. Such a process was in keeping, for example, with Polanyi's (1966) indwelling aspect of tacit knowing; Sergiovanni's (1989) informed intuition; and Bruner (1960), Benner (1984), and Rowles's (1991) notion of practical knowledge. The respondents, as outlined in the *déjà vu* category, had experiences that were associated with their past administrative experiences; to paraphrase them, it was as if they had been there before. The sensations that the respondents were able to articulate, be they visual, physical, mental sensations, or a combination, were in keeping with the levels and modalities that Goldberg (1983) and Vaughan (1989) mentioned in their writings on intuition. The metaphoric cues that were elicited appeared to relate to what Berry (1987) meant when she wrote about implicit processes and what Goldberg (1983) meant by "symbolic" (p. 76) cues that were associated with a particular modality.

The cues that were outlined in the structural theme bring one level of understanding to the research question. The structural cues were not only useful for detecting implicit knowledge experiences but assisted in delineating its function.

CHAPTER 6

The Function of Implicit Knowledge

Introduction

A discussion on identifying the operational dimensions, or the functions, of implicit knowledge is given in this chapter. The findings related to the functional theme are reported. A discussion of the findings then follows.

Identifying the Function of Implicit Knowledge

Reported in this chapter are the operational dimensions (from hereon, these will also be referred to as the functions) of implicit knowledge (see Table 6-1 for a sample). The functional theme emerged from a content analysis of the incidents described by the respondents on how implicit knowledge was used and their comments regarding its purposes. The incidents and comments varied, yet they had overlapping features.

Responses by the respondents showed that implicit knowledge had a particular function or multiple ones. These responses contained a wealth of information, and probing enriched the information. As an illustration, a respondent would mention that he used implicit knowledge to identify a problem; for example, Paul used implicit knowledge when he felt things were abnormal with the student he approached in the hallway. Upon the investigator probing such a comment, the respondent would provide other information relating to the operational dimensions of implicit knowledge. These may have included verifying thoughts that they had concerning the particular incident, picking up more information, and so forth. In the example of the student in the hallway, the investigator's probing elicited information from Paul about how he determined it was the appropriate time to approach the student. The investigator found, upon analyzing these thick descriptions, that each of the respondents had provided information that paralleled data elicited from their colleagues who took part in this study, and from their counterparts that participated in studies that examined

Table 6-1

A Brief Description of the Functions of Implicit Knowledge That Were Reported in the Study

Function[a]	Brief Description
Processing Information	-Used in conjunction with analytic and scientific methods of collecting relevant information -Assisted in gathering information, handling conflicts with policy and institutional expectations, making quick decisions, and acting upon important decisions -Conveyed knowledge that was not provided by formal training -Involved reading people and situations, and using apprizers -Assisted in gathering additional information, deciding on missing links in problems, letting a decision incubate, deciding when to make a decision, and determining when there is enough information to make a decision -Much of the implicit knowledge used in this function was able to be rationalized after the fact, or made comprehensible, through an unidentifiable transformation process -Assisted in collecting information for the other functions
Sensing Problems	-Assisted in identifying problems and actual problems -Assisted in anticipating problems
Arriving at Solutions	-Assisted when there was more than one solution or multiple solutions; when there was no apparent solution -Used in conjunction with analytic and scientific knowledge -Provided alternative solutions -Assisted in finding a balance -Assisted in selecting equivalent solutions

Table 6-1 (Continued)

Function[a]	Brief Description
Process Development	-Assisted when there was no precedent process -Assisted in ill-structured processes or when the process was unclear -Assisted in determining when intervention should occur at various stages of a decision -Experience assisted in developing the ability to use this function -Reading apprizers, people, and situations were linked to this function
Assessment	-Used for assessment, evaluation, and verification -Assisted in selecting knowledge
Complementary Alignment	-Showed that implicit knowledge functions assisted in handling the uncertainty of ill-structured problems -Assisted in determining important decisions -Shaped decisions and actions, especially in terms of how administrators perceive the principalship -Showed that synthetic and analytic skills were used together -Showed that decisions were shadowed by a principal's personal view of the world; especially in terms of a global understanding -Needed because of the people problems associated with the principalship

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[a] There is reason to suspect that all these functions were used in conjunction with analytic and scientific knowledge.

other fields of administration.

Since the research question pertains to implicit knowledge, this chapter only reports those findings that relate to explicit types of knowledge that the investigator deemed necessary. This was done to avoid an artificial report of the information as elicited from the respondents. Furthermore, because the information that was elicited was extensive, the investigator only reported on the data that illustrated the salient experiences of the respondents.

Implicit Knowledge Functions

When asked the first interview question (see Appendix A), most of the respondents mentioned or alluded to a particular function of implicit knowledge. When asked to talk about a very important decision which turned out to be right or wrong, all the respondents provided further information regarding the function of implicit knowledge. A content analysis of the information indicated that this theme would encompass the following functions: processing information, sensing problems, arriving at solutions, process development, assessment, and complementary alignment.

Processing Information

This classification, processing information, constituted an expansive amount of data. As was found with eliciting data regarding the structural cues, the descriptions were initially made with general statements and detail was elicited through probing questions. Later in this chapter, in the section entitled Process Development, the reader is provided with details on how some of these processes had been developed. The present section delineates some of the circumstances in which information is processed. These included gathering information, making quick decisions, handling policy decisions, and acting upon important decisions. By no means are these the only circumstances where this function was employed. But, these are the ones that exemplify the processing information function.

Gathering information. There were a myriad of ways in which implicit knowledge was used by the respondents to gather information. Each respondent mentioned that implicit knowledge was used to gather additional information. Fred, when asked how he knew he had enough information to solve a problem, held the view that "you probably never do" (F2: 32). He added: "There is a certain point in which knowing more doesn't really help much" (F2: 33). Such a view did not prevent Fred, or other respondents, from gathering as much information as resources would permit.

Many of the respondents spoke of gathering information from stakeholders by reading them. Sometimes, the people who were read were used as apprizers because the purposes of the readings were to confirm an idea or to seek reaction to an idea. The respondents indicated that if the information gathered through these readings had to be made comprehensible to either themselves or to other people it was often rationalized after the fact. The respondents were unable to discuss the details of this process. The investigator considered this to be an unidentifiable transformation process. Paul claimed that the apprizers he approached, either consciously or unconsciously, were selected based on his perception.

> Based on my perception, my perception alone, of how I view their competency. . . . It is basically a personal perception based on my experience, my knowledge, my awareness, my sensitivity towards, or whatever. I will often do the same thing with students. (P1: 4)

Fred advised that the reading of both parties to decide when they are ready to settle a dispute is information that is vital. In an incident involving two teachers sharing a work space and one teacher leaving a mess, Fred claimed that he received a "signal" (F1: 11), in the form of an "impression" (F1: 11), that told him "that both of them [parties] appeared to be fed up with the squabbling. They were ready for, they were ripe for, some kind of resolution"

(F1: 11).

Gerry stated that he was aware that he read people. He claimed, "I know that I very frequently seek interchange with people when I am trying to make decisions" (G2: 13). When asked if this was done unconsciously, Gerry's response included a comment which paralleled Fred's notion of implicit readiness.

> Well, I catch myself, I think, more than anything. I think it is just a developed style of dealing with things. . . . I think what happens, . . . is that, . . . we probably just keep churning all the things that we have to churn. At some point, the right slot comes along for each decision, and we make no decisions before their time. [Laughter.] (G2: 13-14)

Tom spoke of "key people" (T1: 24) as being "barometers" (T1: 15) whom he used in his reading of people and emphasized that he did this unconsciously. He proposed: "It doesn't have to be what they say, they could say nothing and that tells me something. They could just be uneasy in their body language, and that tells me a lot" (T1: 24). With one staff member, Tom felt it was important for him to get this one person's "stamp of approval" (T3: 16). He claimed her approval "validates" (T3: 16) what he is going to do. Tom also used this reading ability to identify leaders: "I also pride myself . . . in identifying the indigenous leaders in a particular group [on staff]. Through experience, I learn to quickly identify [intuitively] who those people are" (T1: 13). He then used this knowledge of these leaders in a conscious fashion: "Those are my guides. I consciously watch those barometers to see where . . . [they are] going to go" (T1: 13).

Bill spoke often of unconsciously and consciously seeking more information from various staff members. One teacher, he called "a confidante" (B1:10). Another, whom Bill felt he approached unconsciously on a regular basis, he referred to as "our conscience" (B1: 12).

> We call her "Sister Theresa." She is a wonderful

> person. Anything to do with people, with feelings, I would go to her and say, "What do you think?" Or she would come to me. . . . Sister Theresa . . . [gives] me the community sense. (B1: 12)

Bill emphasized that he did not go along with everything she had to say, but there was a trust in their relationship, and Bill feels she was thinking about his best interests.

Implicit knowledge was also used in determining if there was enough information to make a decision. Fred claimed, "You can never know enough" (F2: 33). Gerry suggested that he had enough information when he was "comfortable" (G2: 16) or there was a "fit" (G1: 9). For Paul, knowing when he had enough information was accompanied by a signal of confidence. Paul explained the signal and its sources.

> I have to feel that strength in being able to defend the decision. That is the confidence factor. . . .
>
> [The strength] comes in part from the ability to analyze the decision. . . . I feel strength in that analysis if I really have a hold of what the issue is. (P1: 2-3)

Paul described getting hold of the issue as also including research (through published writings) or discussions with others (to confirm an action that he would make). He does this "not to basically restate it [the decision], but to give . . . confirmation, that sense of 'Yea, yea. That's right, it fits.' There's a fit feeling" (P1: 3).

Implicit knowledge was further used to determine a missing link in a problem. Fred was the only respondent to discuss this function in any depth. He explained that the missing link comes by "peeling [away] the layers" (F2: 32) of a person or situation. He later indicated that he suspected "that most people have these layers. . . . [And] as you peel the layers, the situation [problem] becomes increasingly complex" (F3: 20).

When gathering information, the respondents spoke of needing time. This need paralleled the notion of incubation. Gerry stated that he would consciously postpone a decision, but felt he would also do so unconsciously if

> I am not ready to make that decision, if I am not comfortable with it . . .: if I don't think that I've got enough information; if I haven't determined if that decision is a right one; or if I don't have the vehicle or vehicles or avenues, to put the decision into practice. (G2: 31)

Paul indicated that by finding "a little bit of time" (P2: 30) he gets

> some sense that I don't have to make [a] decision right away--to escape the urgency; . . . to get in touch with it; to reduce the urgency; . . . to feel like there is some space; and to get some room to maneuver. . . . [Incubation] is another technique, process [for getting more information]. (P2: 30-31)

Fred suggested, in reference to peeling the layers, "If there are underlying problems, the best one could do is buy time, provide some sort of slack" (F2: 33). This in essence is part of Fred's implicit process of gathering information in terms of determining if the problem is the actual one that needs solving. Bill indicated a similar reason for letting a decision incubate in an incident where a vice-principal brought to his attention that, in Bill's absence from school, a large number of students were lured out to the parking lot for some unknown reason during a break. The vice-principal suggested that the school administration confront the issue. Bill had a feeling that he should not act on the suggestion. Over time, there were no complaints from teachers or students. Bill affirmed that before he acts he has to have a feeling as to "what is the [actual] problem" (B3: 23).

Quick decisions. Tom mentioned that he lets his "mail age because a lot of it takes care of itself. The same is [true] with a lot of decisions" (T2: 23). Tom qualified the latter part of his statement by claiming that to think about all decisions in this way is unrealistic to the principalship; often decisions need to be made quickly.

Bill spoke of using implicit knowledge to make decisions quickly when "talking to parents, and in crisis situations" (B1: 22). He elaborated: "You have to make decisions very quickly on how you are going to present [an] argument. . . . Those are interesting times when you . . . don't have time to think [consciously] about what you have" (B1: 22).

Paul spoke of an incident involving a group of three staff members whom, he felt, had been hindering the implementation process of a quality school initiative. One day this group was making fun of the initiative, and Paul immediately decided to react to the mocking. He exploded in front of the three in the staffroom, which was filled with other staff members. Paul felt that his implicit knowledge told him it was the wrong action to take but, as he pointed out, it did not stop him. Paul had this to say about the incident.

> I was tired. . . . I knew what I did, afterwards I knew it, even before I knew it. I didn't use it [implicit knowledge] to stop me, I just knew it. Intuitively, I knew it wasn't going to work. There weren't going to be any good things as a result of it. It might make me feel better, that is the way I rationalized it to that point. It's like, "I'll feel better having exercised this." . . . I can rationalize it and say some good things came out of it. . . . It's not the way I wanted to make those ideas work. . . . But my intuition, or whatever, wouldn't stop me either. . . . It informed me that it was not a wise thing to do, but "What the hell, maybe it would make me feel better."
>
> My actions were totally unconscious, in terms that I knew this was not the right thing to do. (P2: 11-12)

Additional information in regards to quick decisions was provided by Paul during the case study interview. He claimed, "One of the things I do intuitively is think quickly, trust the judgement that I exercise on my feet" (P3: 10).

Some of the respondents mentioned how decisions were guided by policy. On the surface, many of these decisions would seem like they should be able to be made quickly because of the appearance of a clear-cut policy. The respondents, however, described how their implicit knowledge would come into conflict with the policy--how they would base their decisions on something else besides policy.

Policy decisions. Fred and Paul talked at length about how decisions that entailed policy came in conflict with their implicit knowledge. Fred mentioned that when he evaluated teachers, his thoughts unconsciously deviated from policy items as he recorded what was going on in the class. He found that other issues arose as he carried out the task.

> Instead of recording what the teacher is doing and how the teacher is moving--all those kinds of things that are in vogue at the moment in our teacher evaluation, recording of teacher and student behavior--I find myself drifting off to, "What is this class really about? What is this teacher really about? If we were going to do something profoundly different with this talent and with this clientele, how would we do it?" These [questions] are probably not too useful because they certainly are not fulfilling the requirements of the policy very well. (F3: 15)

For Fred, policy has an intent and is used as a guide in administering Livesay Secondary.

A similar view of policy was conveyed by Paul. In decisions involving discipline matters, he explained:

> Lots of times. . . . you are doing something that is in policy and it calls for this decision. But you know that you are really not solving the problem. You are left with no other recourse. You have exhausted all other possibilities. There is something about that, it just doesn't feel right as opposed to the feeling that you get when you have done something, you have made a decision, that is right. (P2: 6)

Paul went on to qualify this response in terms of unwritten policy or organizational expectations.

> I think lots of times we make decisions that our organization expects us to make, but it is uncomfortable many times--it doesn't always fit. . . . I think there is an arbitrariness about organizations that is not very satisfying unless we have been part of whatever it is that the organization is asking us to do. If it is bureaucratic, and you have this role to play, I think there is a lot of distaste for some decisions that have to be made. Then you have to rationalize them; therefore there isn't that fit, there isn't that

> rightness. There is something uncomfortable about it: something that is kind of legalistic, kind of a sterile feeling--"Well, we did the only thing that we could do." (P2: 7-8)

These views of policy are rooted in Paul's practice.

In an incident involving a student being accused of committing a criminal offense (the investigator feels that identification of this incident would jeopardize confidentiality, and is unnecessary for reporting purposes), Paul decided, after careful consideration, that the student needed more than what policy could deliver. Paul described the events that ensued.

> I went to the superintendent . . ., who was not known for his understanding of, sensitivity to, children. I basically said, "In my opinion, it is important that the hearing for expulsion . . . take into consideration what is in the student's best interest: not public floggings or any of the other things that are obviously big in this situation. . . ." I left it at that. (P3: 28)

When the expulsion hearing was over, the board decided not to expel the student. Instead, they gave him 100 hours of community service and the courts handled the alleged crime. Paul claimed that what he said to the superintendent was based upon implicit knowledge. Paul went on to tell the investigator: "What I said to the superintendent was not really conscious. I didn't sit down and think, 'Should I really do this?' I just did it. It was very intuitive" (P3: 28). When the investigator asked Paul if his actions were the right thing to do, Paul replied,

> I didn't know if it would be the right thing to do. . . . But I got a letter the other day from a group of elementary school teachers who thought that it was not a very good thing to do because this may encourage other students to do the same thing when they realize that this kid was not really being punished. I thought to myself, "This is the first time that our superintendent . . . had ever made a decision in the best interest of the child, and the most vocal group opposed to it are the people that are supposed to be the most obviously caring."
>
> So, I thought, "I don't know if it is the right

> thing to do or not." But it was acting totally on gut feeling: that I had to say this; I had to do it. (P3: 28-29)

In summary to this case, Paul made the following point about policy:

> I think the educational structure, system, . . . has to demonstrate that there is no universal law that applies to everyone equally. You have to deal with individual people, and individual circumstances, in the ways that meet their best interests. And, obviously, if there is an inherent danger in those people, endangering others, then you make a decision in the best interest of everyone. (P3: 32)

In using implicit knowledge to handle decisions involving policy, the respondents often referred to having to decide if a problem was important. The respondents talked about how implicit knowledge was used to process information so as to make this judgement.

Important decisions. Respondents spoke of what they believed were either important or unimportant decisions. Gerry's comments reflected those of the other respondents. He stated that "unimportant decisions are whether or not to extend a noon hour for a basketball game. . . ., to buy more paper, or to get the . . . Xerox machine fixed" (G2: 36). Gerry went on to talk about important decisions.

> The important decisions have to do with things that directly affect learning in the classroom. . . . What happens in the classroom is the most important thing about the school. . . . And decisions that lead to kids being in the classroom--in a mood to learn; teachers going to a classroom in a mood to teach and to do it well; and for there to be the appropriate resources for these people to do that job--those are important decisions. (G2: 37)

Bill talked about problems only being problems if they are perceived as such. When the investigator asked what unimportant decisions were, Bill responded by saying:

> An unimportant decision is a decision that really doesn't move you towards your goals, your objective, or doesn't provide goals for staff. . . .

> I think an important decision is if it upsets somebody. . . . This [the principalship] is a very people-oriented business, especially in a leadership role--conflict management, conflict resolution, dealing with people all the time. . . . Often these decisions are implicit. (B2: 40-41)

Fred suggested that what seemed important at one time changes as time progresses. He felt that he might not even recall the specific problem in a two week period.

> What is more important, is the longer term rather than just getting out of the little bind that seems to have developed there: whether it is dealing with a student, a staff member, or a parent, or some other issue that has come along. (F1: 5).

Paul proposed that unimportant decisions were "psuedo-decisions: meeting timelines for documentation; reading timelines for department information; and those kinds of things. . . . They are well-structured. . . . Kind of the administrivia aspects of the job" (P3: 1-2). Paul went on to explain the relationship between implicit knowledge and administrivia type of decisions.

> I think if you have a sense of what you want to do with that administrivia, how you want to direct it or align it, . . . with a system, then the decisions you make must fit into that system. Then it makes those decisions relatively easy. You feel comfortable, good, about that. (P1: 8)

Like policy decisions, the administrivia type of decisions could come into conflict with Paul's implicit knowledge. Paul claimed:

> Decisions can be made because they have to be made; that apparently works. But if my own impression of those decisions, upon reflection and over time, is that they really won't solve the problem, then the problem will just resurface again in a different way or even in the same way; but a decision is made. . . . That's not good. (P1: 8-9)

Sensing Problems

In the previous section the respondents alluded to the notion that the decisions that they were expected to make were along the lines of handling a symptom and not the "real" or "actual" problem. A content analysis of the information elicited uncovered two parallel uses of implicit knowledge, that of identifying problems and anticipating problems. Paul knew that a problem he was working on was the correct one because of, what he called, the "strength" (P1: 3) he possessed in his ability to analyze "the question that has to be decided upon" (P1: 3). He emphasized that many decisions are only dealing with a symptom.

> A lot of things we do in education are not solutions; they are not the right thing to do. We are doing stuff because someone has to do it. . . . How we know it is not right, how you feel about that decision, is the question. You are going to have to see that . . . [problem] over and over again. And you know that; you know that when you make the decision. You know that it is going to come back because you know you haven't solved the problem; you have simply dealt with a symptom. (P2: 5-6)

Fred also felt that many of the problems that he dealt with were only symptomatic. When asked how he knew that a problem was the correct one, Fred suggested:

> I don't know. That's a tough one. . . . See, . . . very often the particular issue that I am dealing with, the particular decision one is dealing with, may in fact be the equivalent to a band-aid on a much larger, more complex, problem that exists in the school. . . . Clearly, a bigger decision may be the better one to make. (F2: 30)

Fred, in a later interview, talked about his ability to sense problems using implicit knowledge. He claimed that he was good at determining where difficulties might lie and said that he was "rarely surprised" (F3: 5) by situations that other people would not anticipate. When the investigator asked him to describe what he goes through in sensing a problem, Fred said:

> I guess . . . one relies on experience. I think some sort of projection where you . . . visualize yourself . . . as a high school kid or as a teacher. I mean, I have been all those things and and I can visualize

> situations from those points of view. I also believe there are many administrators . . . who . . . are not completely establishment. There is that little corner of your mind that is perhaps rebellious. . . . I think I can always see the absurd side of almost everything, even with myself. As a result that corner of your mind enables one to see things in a clearer light in terms of what kinds of things can go wrong, how people will behave in this kind of situation, and so on. (F3: 6)

He concluded this description by stating: "There are things like that I think any good administrator can sense. You can feel it in your bones, and you can project yourself into that kind of situation" (F3: 8).

Bill had something similar to say about administrators being able to sense problems. He believed: "You need a sense of what is important. And what is not important. And to spend time with the important things" (B1: 18). As in the incident of students filling the parking lot during the break, Bill did not sense this as a problem and therefore did not act upon the vice-principal's suggestion that something be done. Bill said this about his ability to sense problems: "I think I am pretty sensitive to problems before they arise because I pick up on a lot of cues. You know something is different about somebody because of the way they behave. You get to know everybody's moods" (B2: 36).

When asked to respond to how successful he was at sensing problems, Gerry made reference to mood swings and being able to sense them.

> It is difficult to determine how successful you really are at that. Nobody really knows that. But I think I can read mood swings in staff. Not only individuals, but the entire staff has mood swings. I think you can detect mood swings in the student body, even though there is a thousand of them. . . . I guess I pick it up [a mood swing] up consciously and unconsciously. . . . I think it has become habitual. (G2: 21-22)

For Tom, what occurred with sensing problems was typical of what has been pointed out with the other respondents. According to Tom, he is good at sensing problems. He claimed: "Do I have my finger on the pulse of what is happening in the school? Yes. With what is happening with the staff? Yes. I am rarely surprised" (T2: 21).

Arriving at Solutions

Paul suggested that implicit knowledge

> works . . . in situations that require creative solutions; problems where there are no apparent solutions, problems that have had one traditional solution to them but need another solution, or where there may be more than one solution. (P2: 27)

In this function, as with many of the others, implicit knowledge was not used solely on its own. Respondents claimed that they used a mix of conscious and unconscious knowledge, as well as skills related to analysis and synthesis. (To delineate when the different forms of knowledge and skills were employed was not pertinent to the research question.) Bill agreed that he used this mix when there was more than one solution. He mentioned two incidents where this occurred: one concerned finding a designated area for smoking; and the other involved deciding which teacher should be assigned to a particular course. Though Bill had difficulty recalling details about the implicit knowledge that he employed in these incidents, he admitted that there was something else used besides that which could be termed explicit.

Paul claimed that implicit knowledge was "useful in that it provides you with alternatives" (P2: 2); or it is useful when "you are confronted with an issue or circumstance wherein you have little time to bring . . . [conscious] knowledge to the surface" (P2: 2).

The respondents claimed that metaphors were used unconsciously to arrive at solutions. Tom's favorite metaphor was the team.

> I think I use the team as a metaphor because of my athletic background and certainly my experience as a member of so many teams. They were all positive experiences. I like that metaphor a lot in terms of

> trying to develop solutions to problems that face us. (T3: 14)

Respondents claimed that a sense of fairness, or the equivalent, was also used. Fred spoke of fairness when there were multiple solutions to a decision: "That is when you dig into the back corners of your mind. You use experience, a sense of right and wrong, one's own belief in fairness, and those sorts of things" (F3: 17). Further, he spoke of being honorable in his decision making. When the investigator asked how he gauged honor, Fred offered the suggestion that it was

> based on whether the other people involved . . . were treated with dignity and fairness; and that . . . there wasn't an undeserving loser in there in some way. I don't know . . . if that makes any sense. It doesn't make a lot of sense to me. [Laughter.] It is very hard to describe those. Those are the kinds of things that philosophers can split hairs about and, perhaps, articulate more clearly. (F2: 3)

Being able to articulate special features of this function was no easy task for Tom, nor the other respondents. Some of the data that was elicited brings to light the notion of balance in terms of fairness.

When the investigator asked Tom how he knew he had achieved a sense of fairness, he replied: "It is an attempt to obtain a balance. I like to think that I have the interest of both parties involved" (F1: 13). Fred provided similar information. In a mark appeal case, Fred thought he "had the perfect balance [between the two parties, the teacher and the student and parent]. . . . There was no winner or loser" (F2: 7). The solution was unclear until he wrote it out on paper. Fred explained he did not know what happened, "it just came" (F2: 9). He went on to declare that the solution was "certainly not brilliant, obviously. What I did, in the end, was find middle ground" (F2: 9). Fred claimed: "Both parties were disappointed with me. Both parties felt that I jobbed them, but . . . the bitterness between them dissipated. Both of them regarded me as somebody that had sold out. To me that was a victory, of sorts" (F2: 7).

Other respondents spoke of using implicit knowledge for selecting from multiple solutions. On the surface, choosing one solution over another would appear insignificant. When employing implicit knowledge, the choice became evident. With multiple solutions, Gerry would "look at the moral, legal, humanistic kinds of things to see which solution to select" (G2: 30). In the end, implicit knowledge through incubation and a comfort feeling was used to determine the choice.

> That [comfort feeling] would go with the right decision. If you can't pick the right one, and each one is open to question on how successful it will be, then there may not be any comfort feeling in picking one. There is simply an anticipation that you'll get to see--it may be bad and it may be good. There is no comfort feeling in that at all. . . .
>
> The comfort feeling will come when the pudding is cooked and you taste it. (G2: 31)

Fred used the metaphor of the coin toss to choose between solutions. In decisions of picking one of two individuals for a position, Fred stated that

> in terms of choosing, let's say coordinators, . . . or choosing other people for administrative positions--or other positions in the school--sometimes it has come down to a virtual coin toss. . . . There is very little to choose. There are some good things, and there are some bad things. (F2: 35)

Fred then provided details as to what he meant by the metaphor.

> If it was a toss up I would say [to the candidates], "I got to the stage where the two of you were just about dead even. And I had to make a decision. I didn't really flip a coin, but the process was so much like that. . . ." I won't mind explaining it like that. I would tell them in those words. I might use expressions like, "It was a toss up; I found you very equal; I believe that you could have done the job; or I think when this comes up again, that you should make an

> application for it." Those kinds of things. (F2: 36)

When the investigator asked Fred what occurred within himself, he replied:

> There are other things that one has [to] consider too: . . . some things that are not part of the job description. I have even used things--this may be . . . a little hidden agenda . . . --such as, I think it would be good for the person. If that was the deciding factor--that I chose Smith because I thought Smith needed that at this point in his career. . . . If I was down to that kind of thinking I wouldn't tell the other one that. . . . I am not even sure if I would know [objectively] if that were the case. But that would be my own sort of judgement call at that time.
>
> It is a judgement call. . . . I would use factors like, "Here is a guy that may be getting this department head position because it will inspire him. He has been on a plateau for a number of years now and, maybe, doing this will, in fact, get him thinking about his job. . . ." Of course, that is taking the job and looking at it from another angle. (F2: 37-38)

Paul provided specifics when he spoke of choosing between solutions in terms of right and wrong. He claimed:

> I am thinking that one of the things that we may do as administrators is that we are always trying to make the right decision out of a fear of making the wrong decision. I don't know how you determine that. I don't know if you . . . [can] determine it. . . . But I am not exactly sure how we arrive at that decision; sometimes, it is just there. I think the is thereness of that decision is probably a combination of things of which we are not really conscious. We see something and react to to it out of a similarity thing; "I have seen this before." Something else happens and it fosters a kind of awareness. We then work our way through the solution knowing that these things are active without being consciously aware that they are active. So, it happens, it just happens. (P2: 4)

The information that Gerry supplied in regards to arriving at solutions came in the form of an incident. Gerry had to make a decision regarding a senior staff member and a change of assignment that was not the choice of that teacher. The teacher was a guidance counselor with a Doctor of Philosophy who was comfortable with his counselling position while no one else was, including students, parents, and teachers. Gerry reassigned the teacher to a mathematics position. As it turned out, the teacher was extremely good in that position. Eventually, the teacher became the department head; and since then, students have performed well. When Gerry talked about this incident, he pointed out how implicit knowledge was used.

> Well, that whole exercise was not very factual business. I mean, it was a matter of impressions and, I guess, almost feelings about what was happening rather than documentable kinds of stuff. Now, I did move it from that arena to documentable kinds of stuff by creating a situation. I developed an appointment system to determine what the reaction of kids would be to the opportunity of being able to choose the counsellor that they would see. He stopped getting the business. . . . (G2: 2-3)

When the investigator probed for details of how Gerry arrived at this solution, he said this was something he did not do before. He was unable to recall if there were other solutions that he considered, but recalled that the appointment system was partially derived from implicit knowledge and was the correct way to achieve the right decision--moving the counsellor to another assignment. When the investigator asked Gerry how he came up with the appointment system idea, Gerry described the process as, "We [school administrators] problem solve so much that it is natural to come to a solution" (G2: 4).

The ambiguity that is associated with Gerry's description of how the process was developed was common among the respondents. To describe implicit knowledge experiences was no easy task for the respondents; however, the information elicited can be delineated to show the importance of implicit knowledge in developing processes for arriving at decisions.

Process Development

Paul spoke of the knowledge that he used for making a decision as coming from "theoretical knowledge, practical knowledge, experiential knowledge, knowledge of people, knowledge of situations and circumstance[s], and knowledge of community" (P2: 3). Paul went on to state, "You are not aware of them--how they are playing as large a role as they might in whatever decisions you make, or how you go about making decisions or doing something" (P2: 3). Fred made a similar comment, "Frankly, I don't pretend to know how all of this [knowledge] comes together, how this sort of crystallizes in the form of a decision" (F1: 5). In response to the investigator's inquiry if there was a process he employed in his decisions, Tom stated, "I don't even know a lot of times how I make a decision" (T1: 28).

These comments appear to indicate that the respondents were unable to provide information regarding the processes used in arriving at decisions; however, the data collected indicated otherwise. The information elicited provided a wealth of data. From this emerged the process development function. Information in this function is discussed under the following headings: the absence of models, automatic processes, ill-structured problems, and experience.

The absence of models. The respondents suggested that to communicate or develop a model on how they arrived at decisions is next to impossible. Fred claimed that he had no "structured process" (F1: 17), model, for decision making and said: "I don't sit down and write the pluses and minuses. . . . The problem, I think, is that every decision has . . . a broad spectrum" (F1: 17). The respondents were very aware of the value of implicit knowledge for developing processes for their decisions. Fred pointed out that this function was valuable because formal training courses were unable to provide all the necessary knowledge needed to operate in the principalship.

> There are very few, if any, courses available that give you some idea of how to deal with . . . conflict resolutions and so on. There is very little out there that tells you how to deal with a teacher that is going through divorce . . . and how that has spilled over into

> his or her work situation. (F1: 8-9)

Gerry also made reference to training courses: "I don't necessarily think back to a class, How to Make a Decision 201, when I am making a decision" (G1: 3). He emphasized that the process "would depend upon the issue and the context. There is no scientific or rational process that is followed" (G1: 5).

In the absence of a model in the decision-making process, the respondents indicated that the use of implicit knowledge for developing processes was not all that foreign. When asked if he could develop a flow chart for his decision-making process, Gerry replied: "I would probably be able to develop one that I think I should follow. [Laughter.] But I don't think I could" (G2: 15). Fred had a similar response:

> I don't think I have a process in the sense that you can draw a flow chart. It may sort of turn out that way. I suppose after the fact one could easily say, "Here's a flow chart for that." Whether they would all look the same or not, I don't know. Certainly, I don't have anything put in place at the moment where, you know, "Oh, oh. Here's a problem. Here's the decision that has to be made. Here's what I'm going to do." You know, write down the pros, the cons. . . . No, I don't have a process. (F2: 29)

Paul stated: "I try to figure it out afterwards, how something came about, in reflective thinking about it. I am not so sure that it is a model as much as it is a process, a survival strategy" (P2: 19).

Automatic processes. Tom and Gerry indicated that some of the processes that were developed are now carried out automatically. Tom suggested that many of the things that he did to gather knowledge about people were done unconsciously and automatically, such as walking the hallways of the school. He claimed that his "Manage[ment] by Walking Around" (T1: 11) was something which he did without thinking. In commenting on automatic knowledge, especially those involving processes, Gerry remarked how he would apply a process used in one problem to other problems. He stated that this application of processes "becomes automatic, becomes part of your vocabulary" (G1: 18).

Ill-structured problems. The content analysis revealed that implicit knowledge was used in ill-structured problems or situations. Information elicited from Fred and Paul illustrated this use. Fred described a mark appeal incident where the distinction between the problem being ill structured or well structured was not obvious. Fred stated that the mark appeal

> was well structured in the sense that the issues were very clear along the way. They were based, in part, on school policies that are clearly laid out, except . . . [with how] the teacher was applying them. I never considered that a teacher would apply the policy in the way that she did. It was in the application that it was peculiar [ill structured]. (F2: 11)

In brief, the teacher taught a two part course and applied one mark. Fred explained: "Technically[,] they are two part courses; but for all intents and purposes, traditionally, we treat them as one course. So the kids end up with the same mark in two different courses" (F2: 5). Fred talked about another incident where implicit knowledge was used with ill-structured problems.

In this incident, where no precedent process existed, Fred made a decision to confront the media on an issue that he thought was unfair to the school. A community newspaper reported on the results of a court case that involved a young male shooting a young female. According to Fred:

> The local press made a big deal, or what I thought was a big deal, of the fact that he [the young man] was a former student of Livesay. I looked up his recorders and found that he had been here for really a couple days as an eighteen year old in a Grade 10 program. . . .
>
> I felt that it was important that I do something to

> indicate that this was unfair to the school. I felt that I really had to react to that. . . . (F1: 6)

Fred decided to compose a letter that would be sent to the editor of the newspaper. Prior to sending the letter he circulated it to a selected group of teachers, a group of parents, and to personal family members for their reactions. For Fred, this incident with the newspaper was new and one where no process for handling the press existed. In reference to this incident, no information was uncovered as to how the process was developed.

Paul used implicit knowledge to handle an ill-structured problem with three teachers and the unclear processes for implementing changes in a planned initiative. In his efforts to implement a quality school initiative, Paul claimed he had come to accept change as "small but effective, deliberate, and intentional" (P3: 18). He further explained:

> I go three years down the road and say, "Where do I want to be three years from now?" Then I go backwards and say, "Okay, now I am going to introduce it this way." I have six or eight months of chaos, anarchy, dislocation, constructive criticism, discussion, stuff, junk; but, one or two little things will have changed in that six or eight months. (P3: 18)

Three changes that Paul wanted to implement immediately were to "increase professional discussion and dialogue . . .[,] and introduce . . . different models for teaching" (P3: 19), and use the staff meetings for these ideas to flourish. The first thing Paul said he had to do was change the agenda of the staff meetings so as to accommodate the other two initiatives. Paul described what occurred in this part of the process.

> The first thing on my agenda was to change the staff meeting--but it was unstated. I unconsciously created it, which I think I did, because it was what I wanted to accomplish. I wasn't exactly sure I was going to do it, but I knew it was one of the things that had to happen this year. The other thing that had to happen this year was an open, frank . . ., discussion about innovation to

> change. (P3: 19-20)

This was the time in which Paul grew frustrated with the three staff members who were mocking the quality school initiative. Paul's reaction to the three staff members became part of the process. In Paul's opinion, his reaction put an end to this mocking.

> Maybe that is one of the reasons why, subconsciously, I killed it [the mocking] by doing what I did. . . . But it was very much intuition: that said, "This is a time to end this . . . [mocking]." And I did. So it was . . . not a rational, logical, post-hoc kind of analysis. I saw an opportunity to really effect change, and I took it. It was the wrong thing to do, but it was the right time for something to be done; and it had to be fairly boisterous and dynamic. (P3: 20)

Tom provided two incidents that illustrated the use of implicit knowledge in ill-structured problems. One incident involved two students in a vicious fight: one parent, a single mother, was ready to charge the other student with assault. Tom had no idea how he was going to handle a meeting with the two boys and their parents. Tom asked the parents, the single mother and the other parents (a staff member and his wife), to leave while Tom talked to the two boys. The teacher parent returned to his class and the two women went to have a coffee. Tom gave the boys a few dollars and told them to go to the cafeteria and have a bite to eat. He told the boys:

> "Here is what I want you to do. . . . I want you to go to the cafeteria. I want you to have lunch together. I have discovered that you don't eat with people you don't like and you are not friends with. . . . I'll see you after lunch. You can tell me how it went." (T3: 31-32)

As the incident turned out, the two women talked as did the two boys. An understanding was reached between all parties and no charges were laid. This problem was not solved in an "analytical" (T3: 29) fashion. Every event that took place was implicitly maneuvered by Tom at the right moment.

In the other incident, 12 students placed graffiti around the school, and the police were called in and took pictures. Tom was able to identify one student involved in the incident by the nature of some of the graffiti. In questioning this student, Tom was given the name of the others. Tom went on to explain the events.

> I didn't know what I was going to do. How I was going to handle this. It came to me [Tom snaps his fingers]. Again, I said to myself, "That's a good idea." I decided to get a committee together of three parents, three staff, and three students.
>
> I asked each of the students [involved in the graffiti incident] to give me their own version of what happened that night, . . . to write it down. After receiving those, I interviewed the students and got more information from them. (T3: 33)

Tom then mentioned to these students what could happen and that he would turn the information over to the committee to make a decision. He said to the committee:

> "Here are the range of things that you could do. I want you to make recommendations to me, keeping in mind that I don't need to accept your recommendations. But I would like to know what you have to say. I will then make a decision based on your recommendations." (T3: 34)

The decision was made by Tom and the matter was handled internally. Tom had this to say about the process in the graffiti incident:

> That was a process that surprised me. I had never seen it done before. I didn't know of that model. It just made sense to me that the community that was affected should deal with it and that I would like to get their counsel and advice as to what to do.
>
> The end result is, . . . that I received . . . nice letter[s]. . . . I . . . received comments from Board members and from other schools about what a great idea this discipline committee is. . . . It wasn't a textbook or carefully planned process. It was, "This is what I am going to do." And I didn't even know where it came from. (T3: 35)

Experience. During the case study, Fred drew a link between experience and developing processes. When asked if he saw implicit knowledge being employed in the handling of Shawn, Fred stated:

> Yea. All kinds of it. Certainly experience, because if you just fell into the job here and you found that there was a teacher like Shawn out there who was breaking the rules . . . your first thought would be that this was trouble and we've got to get rid of this guy. . . . And you look at it from the other direction and say. "What about the educational experiences of these kids?" Teacher "B" over there is following all the rules in the book, but there is no magic in that classroom. Shawn here is actually accomplishing some desirable educational goals. (F3: 32)

Fred told of two other incidents where experience was crucial in the function of process development. Fred recalled a graffiti incident in which he was being observed by a number of students as he was looking at the graffiti and deciding what to do. Fred claimed that his action was "based upon my experience, that if, in fact, you make things bigger [than they are] then they have a way of snowballing and the issue ceases to be the little silly thing" (F1: 21). The comment that Fred made in front of the students was, "'Boy, we really have a poet here. Right?'" (F1: 19). Fred indicated that such a comment was automatic. Furthermore, Fred was unconsciously sensitive to the idea that a different reaction to the graffiti by him may have resulted in a different reaction by the students, a possible power struggle.

> That ends up with a clear winner, a clear loser, and probably all kinds of spin-off things that do not reduce the likelihood that this will happen in the future. In fact, if anything, they increase the likelihood that it will happen again--the way to get Palmer's goat, the way to get him really going is to write on the walls. He goes nuts, there is some entertainment value in that. (F1: 21)

Fred qualified this response by saying,

> I guess from my perspective, it is knowledge from what I have seen in the actions of others, and from when I have been caught in these things myself. Generally, when I wish I would have done it differently, I have in fact reacted in a knee-jerk fashion. (F1: 21)

The other incident involved two teachers sharing a work space and one of them leaving a mess. In essence, Fred let the two individuals settle the matter themselves by setting the stage for them to be alone in his office. Fred explained what occurred when he returned to his office.

> I came back in. When I tried to clarify as to what were the new rules of the game, they told me to get off their case--that they had settled it. . . .
>
> My decision to maneuver this situation, which may be somewhat Machiavellian, seemed to help everybody. I guess this is an example where I, perhaps, got lucky. What I used for knowledge was my knowledge of them as people; I used my knowledge of, my experience of, working with people; and I used, I think, my own personal sense of right or wrong because I refused to take sides. Before I got them together, both of them were angry with me because I would not take up their cause. I did not, in fact, go to the other and tell them to smarten up once and for all. (F1: 8)

When asked by the investigator how he knew it was the right time to intervene, Fred explained that he received a signal

> that both of them appeared to be fed up with the squabbling. They were ready for, they were ripe for, some kind of resolution. I got the impression that both of them had finally given up on impressing upon me that they were that hard done by. (F1: 11)

The way in which experience lends itself to developing processes was further associated with reading people and situations. Paul claimed that he learned to read people and situations through his "experiences of dealing with people. Being street smart in lots of ways. . . . Having to be resourceful with yourself" (P2: 18). Paul suggested that being able to read people and situations was part of the job and required trust in implicit abilities, meaning "trusting your instincts, trusting your ability to read a situation and to make a decision. This is how street people survive" (P2: 21).

Bill also provided information regarding how he picked up the ability to read people. In an isomorphic manner, he learned it through his father.

> I think you have to [have it] as a principal, a leader.

> . . . I think it is almost a cultural thing. It is almost a family thing. It's a thing that my father had. . . . I think I learned a lot of that from him. I'd sit around listening to him talk about people I knew. He'd make a lot of judgements about people, characters. (B2: 36-37)

Tom claimed that he isomorphically picked up the ability to read people during childhood from a Mrs. Crane who ran a hardware store. When he went to select a birthday gift for his mother, Mrs. Crane would advise him. He went to some length to describe situations involving Mrs. Crane, but they do not indicate the specifics of how Tom learned the process. He was, however, positive that Mrs. Crane taught him how to unconsciously read and advise people.

> I do it intuitively. She taught me how to understand and read people because she did it to me. . . .
>
> I don't do it [advise people] in a negative way. At least I don't think I do. I have never had anyone say that I manipulated them. I have steered them in a different direction. But it has always been to their advantage. . . . I am good at that. I know I am good. How do I do it? I don't know, but it is intuitive. (T1: 23-24)

For Tom, reading people was part of the decision-making process which was "not only unconscious, but . . . automatic" (T2: 31). When the investigator probed for details regarding Tom's reference to reaching into the "corner of your mind" (T2: 18) for knowledge, Tom replied:

> I probably . . . implicitly do things that I don't even know that I do because of all my experiences. At the same time that which I am conscious of is, because of my experience, "Hold it, I've been here before. I better stop and think about this one." That is what I am conscious of. I am not conscious of all that experience that I have had and how it has helped me to make the decision. (T2: 19)

In relation to the case study and how to handle Shawn, Tom said implicit knowledge based on experience would definitely be involved.

> Most definitely. I don't think that I could run to a book and find out how to solve Shawn Brown's particular

> problem. It would be based a lot on me as a person, how I view him, what I expect of him, and what my past experiences have been. . . . He fits part of the puzzle that I have for the school. I would attempt to reassert and broaden the role I see for him fitting into the staff. (T3: 23)

Assessment

Much of the information elicited from the respondents that is associated with the assessment function has already been mentioned and some of it is worth re-emphasizing. Other information has only been mentioned in brief and requires more discussion.

The assessment function appeared to be related to implicit knowledge being used by the respondents to assess decisions, as well as to understand subjects (be they people or situations) and to analyze and synthesize knowledge or processes (be they conscious or unconscious). This function took on the form of assessment, to judge or estimate the value or character of something; the form of evaluation, to set or determine the value of something; or the form of verification, to confirm or ascertain the truth about something. These forms have overlapping features, as does the information elicited from the respondents. For this reason, the investigator had difficulty labelling the data as having a particular form. Because the term assessment is the one that covered the majority of information elicited, the terms evaluation and verification are only used in the reporting of the findings when one of the respondents used a specific term or when the investigator felt one of the terms was more appropriate for reporting the data.

The respondents spoke of implicit knowledge being used to assess decisions in terms of fairness, right or wrong or both, and fit. Paul affirmed that implicit knowledge "could be" (P1: 7) employed for evaluative purpose in determining if a decision is going to be right or wrong. When asked how he makes this evaluation, Paul said it is "partly experience, partly gut feeling, and partly a sense . . ., you read the climate" (P2: 3). Tom suggested that he really did not know if the decision was right or wrong until other people reacted to it. He did qualify his suggestion by stating, "I may have a gut feeling" (T1: 13), and that he would only pick a decision that he determined to be right. Gerry shed light on this function when he talked about the comfort feeling being used by him to determine if he was going to take a particular action. He stated: "We talked about comfort before. And that has to be in place" (G2: 7). In having to make a decision as to whether a support staff member or a teacher should be released from their current assignment, Bill stated, "I think a lot of it is implicit in your mind as to who is fitting in and who isn't" (B2: 16).

Other information revolved around the choosing between multiple solutions and reading people and situations. In these circumstances, implicit knowledge was used as an assessment vehicle. Fred spoke of "a judgement call" (F2: 38) when a decision came down to two choices. He also referred to arriving at these type of decisions through a "coin toss" (F2: 35). Knowing when to toss the coin, "when you have reached the point where everything is even" (F2: 42), is a crucial assessment.

Paul spoke of using implicit knowledge for verification purposes and described what occurs with decisions that have more than one solution and each is "equally distasteful" (P2: 5). Paul suggested that there is a feeling that the problem "is going to come back because you know you haven't solved the problem. . . . You know it because of the fact that it may be one of those déjà vu things" (P2: 6). Paul also talked about using this function when reading people. He claimed these readings involved picking up on clues.

> Body language. Eye movements. Mouth, lots of mouth things. Some of the other things might be other people reacting to other people, keying in on certain people that seem to be a focus, and reading what happens between them and other people. (P2: 22)

Tom also talked about using this function when reading people. He provided two incidents where he interviewed teachers and had to assess their credentials. In both incidents Tom ignored his implicit knowledge and regrets that. Tom described what occurred when he failed to check out a reference thoroughly.

> The reference was really good. But I had a feeling . . . and I knew the reference didn't tell me what I really wanted to know. It said he was a nice guy, a hard worker, and all this sort of stuff. "But can he do it? Can he teach?" . . . I was listening to everybody else [but to myself]. . . .
>
> I said to myself, "Yea, but I should find out other things that are just as important because in the long run that is what is going to make a difference." Well, I didn't. And that was wrong. I should have checked beyond that point. (T2: 3-4)

In the other incident, Tom was assessing the ability of two candidates. One candidate was referred to by one of the references as the "'Pied Piper. . . . But boy, if he doesn't like your decision you won't get him to do anything. He'll fight you all the way'" (T2: 16). The other candidate was considered "a powerful guy, great credentials, terrific experiences" (T2: 15). Tom said that he listened to the other people on the interview team and went with the latter candidate. Tom explained what happened:

> He got killed in the classroom. I had to pull him off the program halfway through, and I had to put somebody else in his place. He did know his stuff; he was terrific that way. But I knew that was not the thing I wanted. . . . I knew, I had a gut feeling even as we were making the decision. Even as I was making the phone call [to the Pied Piper] . . ., I said to myself . . ., "Geez, I hate to do this because I really should be hiring this guy." . . . And I didn't. I didn't follow through. (T2: 16-17)

Though Tom's incidents could be considered incorrect decisions, they do illustrate the use of implicit knowledge for assessment purposes. If Tom had gone with his implicit knowledge, the decisions may have turned out to be correct ones. Other respondents spoke of using the function in teacher evaluation.

Fred found himself drifting from policy and unconsciously asking himself questions such as "What is this class really about? What is this teacher really about?" (F3: 15) This chapter pointed out how Bill used implicit knowledge in determining that a teacher just did not seem like a senior level science teacher, "'You just don't look right to me'" (B2: 23). In another incident, one of evaluating an English teacher, Bill said: "I thought she didn't seem to have the love for the subject. Those kinds of things. And that is implicit too. You assess whether or not that this person is excited about their subject" (B3: 8). Bill went on to state the following about observing teachers.

> I think what is implicit is when you observe teachers and students interact. . . . You know, how does one measure that there is a good interaction as opposed to a poor one. What I look for, perhaps unconsciously, is the teacher involving the student in the lesson: that there will be students from the front of the room, the back of the room, and all over; either directly or indirectly, students are asking questions. (B3: 9-10)

Much of the information that has been reported, thus far, is connected to respondents using implicit knowledge to make their decisions in terms of the whole as opposed to a part of the whole. In arriving at decisions, respondents spoke of having both conscious and unconscious decisions complement or fit their vision for the school or system. To cite Paul, a decision is also made so as to "align it . . . with . . . a system" (P1: 8). To fully appreciate the functions of implicit knowledge, an understanding of how the respondents used implicit knowledge in its complementary alignment function is beneficial.

Complementary Alignment

In this section, information elicited from the respondents is outlined in such a way as to illustrate how implicit knowledge was used so that a decision was complementary and aligned with a particular belief system: how implicit knowledge was used by respondents to make decisions involving ethics, fairness, ill-structured and well-structured problems, and so forth. The information showed that decisions involving implicit knowledge required skills normally associated with synthesis. The synthetic skills were carried out using abstractions that made practical sense to each respondent so that the schools they administered were a better place for all stakeholders. Many of these abstractions appeared to be philosophical in nature, and were connected to the respondents' global understanding or bigger picture of the school they administered. Moreover, the abstractions were oriented towards what each respondent believed decision making in their respective senior secondary principalships entailed.

Respondents talked about using implicit knowledge to make decisions in light of particular ethical concerns or, in the terms of some of the respondents, rightness and wrongness or goodness and badness. Gerry mentioned that he did not make many wrong decisions that employed implicit knowledge, only inappropriate ones.

> The place where I occasionally make an inappropriate decision is how to deal with someone within the system where I need something from them for the school, and where I get tired of maintaining the relationship that I don't think is paying off. But in the long term, that relationship is important for the school. Many times this is where you have to compromise in order to not lose resources for the school. (G1: 15-16)

These decisions were accompanied by an uncomfortable, physical feeling; the reader should recall that Gerry equated comfortable feelings with "a sense of rightness" (G1: 22). A sense of rightness was viewed by Paul as being at the core of many of his decisions. He claimed this involved a fit which "is weighed in terms of rightness and wrongness, ethically and morally. That's feeling, that's intuition, that's judgement" (P1: 6). Paul went on to state:

> It's a nurture process. Nurtured in the sense of having something stronger than intuition, like a built-in morality. A built-in sense of not quite rightness, if you like. It sounds a little bit righteous, but it is a sense, a comfortable feeling, a consensus feeling, a consistent feeling, or a feeling of "Yea, I feel good about that. I would feel good about that decision being made if it were being made on my behalf; or, if it was being made about something that I would be concerned about." (P1: 7)

Paul, like Gerry, felt if that rightness did not exist "there was something uncomfortable about it" (P2: 8).

Fred saw decisions that employed implicit knowledge in terms of justice and honor. Fred considered rightness to be measured, in part, by justice. He claimed that justice must be done and appear to be done; however, the appearance of justice is sometimes difficult to accomplish. For example, Fred talked about professionally handling a parent's complaint of a teacher. He felt

> there is just no way that you can tell, say a disgruntled parent, that you are in fact taking this teacher to task and applying whatever means that we have available to us: letters on file, and that sort of thing. There is just no way that a parent can ever know that that has happened. You can't say that you are going to do that: that's unprofessional; it is just not right. (F2: 10)

Fred added: "I think I have thought about that part of it [the appearance of justice being done] more. In my own mind, I have sort of articulated that more clearly to myself than I had done before" (F2: 10). Though Fred did not give particulars, his comments regarding his motives or his decisions as being honorable illustrated the thought that went into this matter; as mentioned, Fred gauged honor in terms of "whether the other people involved . . . were treated with dignity and fairness" (F2: 3).

Bill claimed that a sense of "fairness" (B2: 15) was involved in decisions recommending continuing contracts. As pointed out earlier, Bill thought that "a lot of it is implicit in your mind as to who is fitting in and who isn't" (B2: 16). Though Bill was unable to provide specifics, he did provide information on a personal level in regards to replacing personnel.

> I certainly have had to replace a lot of people over the years. . . . This is where I find you really earn your administrative allowance when you have to look at somebody and say, ". . . I think you should go to another school. I don't think you should work here anymore." Who I am I to say that? Who am I to say what is best for you? [Uneasy laughter.] (B2: 15)

Fairness, for Fred, was crucial in many of the decisions that he has had to make. In the incident of the mark appeal decision, fairness shadowed Fred's decision. He felt he had

> to change hats to some degree, to become a judge as opposed to a manager. . . . Then I have to grind through all the evidence: look at all policies; look at the teachers; look at the collection of facts. I hear the teacher out and hear the student out. Then I, ultimately render a decision. That is where my sense of fairness, I think, becomes more important than the knowledge base. (F1: 9-10)

One of the areas that the investigator began to focus on early in the study was that of ill-structured and well-structured problems. The pilot participants often indicated that implicit knowledge was associated with ill-structured problems while more analytic and scientific knowledge was associated with well-structured problems. The information elicited from the respondents showed another dimension of this relationship; it revolved around how the respondents perceived ill-structured problems being linked to people. Fred had this to say about problems being ill structured and well structured as they related to senior secondary administration.

> [They are] the whole gamut. . . . I think most of them become well structured after the fact. Since you are dealing with people, I guess it is the people component that makes them more poorly structured than problems that an engineer would have in dealing with a bridge. (F3: 28)

Bill suggested that "problems are definitely not well structured. But I am not sure if they are ill structured. The problems are kind of a loose fit. Because the problems involve people, sometimes they really vary" (B2: 45). Gerry felt that

> the problems are usually ill structured.
>
> A lot of the problems are fairly random. . . . Many of them come unexpectedly. Many of them result from human behavior that is not always terribly predictable. They come out of emotion, disappointment, out of a lack of values; directing a person's behavior, or whatever. (G3: 4)

Tom's comments regarding ill-structured problems paralleled those of Fred, Bill, and Gerry. Tom added a practical dimension that he had encountered when handling unexpected problems. He considered problems in school to be "messy" (T3: 19). He mentioned that when he attempted to solve a problem in a structured way, he knew that the structure could break apart.

> I know full well that around the corner, be it a week, a month, or two months from now, a new problem is going to take priority over this. The best structure in the world that I have will not guarantee that we will follow through with it. (T3: 18-19)

The respondents' abilities to handle any uncertainty associated with ill-structured problems appeared to be related to notions associated with complementary alignment. Two of the respondents were specific about handling this uncertainty. They felt that risk taking was crucial to administration. According to Paul: "Good administrators aren't afraid to make decisions. You have to believe that you are going to be right by not being afraid to make decisions" (P2: 4-5). Bill pointed out the close link that risk taking has with implicit knowledge.

> I think you have to risk. That is the big thing in administration. You have to risk doing this. . . . If it doesn't work, if it doesn't go well, then I'll say, "Why . . . did I do that? I could have . . . [done] something else." And I know that. And I will live with

> that. I can take the risk. If you don't risk, you're not worth a damn. . . . You have to risk, and grow up and do some things that you feel in your heart are the right things to do. There is a rationale that that's a higher priority than something else. You have to do that, and you may lose. (B1: 19-20)

The link with the heart and risk taking was expressed by Tom as knowing that he could make a difference for the school. In a decision regarding the changing of the length of class periods, which may appear on the surface to be a well-structured issue, Tom realized that people were involved who would be affected by the change. He acknowledged that implicit knowledge assisted him in this decision.

> I did this because of what I saw and what I thought would make a difference in terms of the effective use of time. . . . I did not use entirely, what I think, was an explicit decision-making process--it was mostly implicit. (T2: 6-7)

As a result, the majority of reactions to date with the timetable change have been positive.

Information elicited from the respondents indicated that complementary alignment was linked to how the respondents perceived important and unimportant decisions, especially in terms of how the respondents perceived the office of the principalship. For Paul, unimportant decisions were those that he termed "the administrivia aspects of the job" (P3: 2). Paul added that these are "not important in my administrative role unless it impacts the people I am working with, the students; what happens to them in their environment" (P3: 2). In keeping with these ideas, Bill suggested: "You need a sense of what is important. And what is not important. And to spend time with the important things" (B1: 18). Furthermore, Bill claimed that important decisions are those that move you towards your vision of the school. For Fred, important decisions are those

> that we make at the school level . . . in terms of which personnel to have in the school . . .--who to hire when

> I have a choice. Then one is, in fact, going by a lot of intuitive knowledge, a lot of implicit knowledge. It is a gut feeling about a person: "Should I hire you? Will you fit in on the staff?" These are gut feelings in many ways. (F3: 25)

Fred further suggested that the principle of a decision is as important as the facts involved in the decision. To make this point he used the incident of a mark appeal case where a student appealed a spread of one mark. Fred considered not only the arithmetic facts but the principle of the appeal.

> Is the principle of the thing [the appeal] sufficiently important to you [the student] that you want to go after that one mark? . . . Does it mean a scholarship? Does it mean entrance to university? . . . If they say yes . . . then I pursue it. (F1: 13-14)

Such decisions for the respondents were also shadowed by their perceptions of their role as a school principal. Information elicited from Gerry and Fred best illustrated this finding. For Gerry, decisions were made with others. He viewed himself in the realm of signing a "decision as the representative" (G1: 19) for the stakeholders. For Fred, his perspective of his role as an administrator has changed over the years and been shaped by implicit knowledge.

> I think 10 years ago I was . . . more concerned with my own authority, and trying to ensure that my own authority was not being eroded as a result of decisions. Somehow or other that was an important factor: that I had to make sure that I came out of a situation without having lost anything. I think I am less worried about that now--hardly at all--that if I make this decision, that somehow I would look bad as a person. I concern myself about the school looking bad, about this office looking bad. I don't concern myself very much, now, with me personally looking bad. . . .
>
> Maybe this is where some kind of wisdom takes over. Now I could be dead wrong. It could be that that is the wrong way of doing things--that maintaining your personal authority is somehow central to running a school. I have come to believe that less and less. It is the authority of the office. In other words, take your job seriously but don't take yourself seriously--that kind of general approach to things.

(F1: 23-24)

Though all the respondents provided information related to the significance of the complementary alignment function, it was Gerry's and Fred's comments that captured the views of the other school administrators. In the words of the investigator, school administrators' decisions are often encompassed by their perceptions of the office, the principalship, they hold.

Discussion

This theme uncovered six functions of implicit knowledge: processing information, sensing problems, arriving at solutions, process development, assessment, and complementary alignment. These functions paralleled many of the findings of the literature review. There is reason to suspect that other functions would have emerged if the study had been conducted at a different time or with different respondents. Moreover, the findings do not suggest that other functions that appeared in the literature review are irrelevant to this study. In other words, the information elicited was situational and respondent specific.

Generally, this theme's findings were in keeping with a review of the literature which found that upper and middle managers used implicit knowledge, in conjunction with explicit knowledge that is associated with or derived from analytic and scientific knowledge, for a variety of purposes. A discussion focusing specifically on the six functions would be repetitive in terms of the literature review. Far more pertinent to understanding this theme, are the findings that are distinct to this study or have limited discussion in other studies.

The first of these has to do with a methodological barrier. The investigator had difficulty eliciting details and specifics directly from the respondents in regards to the functions. The investigator had an inkling, from conducting the pilot and what was uncovered in the literature, that the functions had a major role in administrators' decisions. The investigator assumes that this barrier was overcome by letting the respondents talk about incidents and letting them comment on their implicit knowledge experiences. The end result was a host of data which were interpreted as being related to particular functions of implicit knowledge.

A related methodological concern that arose focused on how the respondents were able to make certain aspects of their implicit knowledge experiences comprehensible. As suggested by Berry (1987) some implicit knowledge can be rationalized after the fact because it was once declarative knowledge or because the investigator asked, knowingly or unknowingly, the right question. There is no doubt that both of these happened. What was impossible to determine, even though probing questions were used, was how implicit knowledge was transformed into something that was comprehensible. Nevertheless, the data elicited from the respondents indicated that an unidentifiable transformation process did occur.

Weick (1982), in his article on loosely coupled schools, suggested that school administrators must perform a "difficult balancing act--balancing between adaptation and adaptability, between stability to handle present demands and flexibility to handle unanticipated demands" (p. 674). A parallel notion, based on Niccolo Machiavelli's work, was proposed by English (1992). English held the view that school principals, as executives, have an arbitrariness in their decision-making authority that permits them to be responsive to unique problems that arise. Today, such notions of administering schools are well accepted. Weick assumed that schools were people places and that the balancing act could be accomplished through

> a combination of symbol management, selective centralization, consistent articulation of a common vision, interpretation of diverse actions in terms of

> common themes, and by the provision of a common language in terms of which people can explain their own actions in a meaningful way and communicate with another in similar terms. (p. 676)

English claimed that principals, in acting in their executive capacity, must show strong leadership and go beyond policy--"engage in creative insubordination" (pp. 12-13). There appears to be a link between principals becoming proficient with handling English's (1992) and Weick's (1982) suggestions and the nature of implicit knowledge. This link becomes obvious when viewed in terms of how the functions of implicit knowledge contributed to that proficiency.

A feature that prevailed in many of the theme's findings is that of making the "right" decision. Polanyi (1966) wrote about the skills required for making the right decision. Among these would be, at a conscious and unconscious level, "'knowing' . . . both practical and theoretical knowledge" (p. 7). The findings indicated that the respondents went beyond that knowledge that was declarative. They trusted their implicit knowledge so as to arrive at the "right" decision; including decisions that involved conflicts with policy or organizational expectations. Furthermore, the functions of implicit knowledge (such as the reading of people and situations; the confirming of ideas with others; taking ideas and 'bouncing them off of people'; and similar actions) were accepted as part and parcel of the decision-making process. To use people as "apprizers," people who consciously or unconsciously inform on ideas, was a skill that was vital to the principalship. The information elicited from the apprizers was localized and provided the respondents with pertinent information so as to make decisions.

The findings showed that the functions of implicit knowledge provided alternative knowledge and processes for arriving at decisions that were not available through more formalized means. Such findings are in keeping with the complexity of the principalship and Renihan and Renihan's (1992) notion of "renaissance leaders[--who] accept, and are willing to confront, the challenge of complexity" (p. 11). Linked to the complexity of the principalship is making human-resource decisions, which are often ill structured; being able to sense problems, anticipating and determining actual problems; and being able to assess, verify, or evaluate problems and related information. On one level, this requires the "risk taking" and the "heart" that were mentioned by the respondents. On another level, this requires handling the uncertainty that accompanies many decisions.

The respondents spoke of how implicit knowledge assisted in handling the complexity, and the uncertainty, associated with many decisions. This required using skills related to synthesis. The information elicited further suggested that synthetic skills were used in conjunction with analytic skills. Such a finding is supported by Bruner (1960), who claimed that familiarity with a domain of knowledge permits a person to "leap about, skipping steps and employing short cuts" (p. 58); by de Bono (1990), who proposed "the concepts of 'fit' and 'flow'" (p. 291) in how people think in terms of "perception (water) logic" (p. 291); and by Mintzberg (1967), who declared that organizational effectiveness "lies in a blend of clear-headed logic and powerful intuition [implicit knowledge]" (p. 58).

Complementary alignment, as a construct for one of the functions of implicit knowledge, illustrated the importance of the synthetic skills for administering schools. Decisions by school administrators are shadowed by ethical concerns, or the like. To be conscious of all these concerns is next to impossible. Complementary alignment permitted the respondents to address these concerns in terms of their global understanding of the schools they administer. An operating base for complementary alignment, as interpreted from the respondents' experiences, is for school administrators to appreciate how their decisions are influenced by their perceptions of the office they hold.

CHAPTER 7

The Context of Implicit Knowledge

Introduction

Outlined in this chapter are issues related to the contextual characterizations of implicit knowledge. The findings of the contextual theme are reported, followed by a discussion of the findings.

The Contextual Characterizations of Implicit Knowledge

The contexts in which implicit knowledge were employed by the respondents is reported in this chapter (see Table 7-1 for a sample of the incidents). They were characterized, based upon the investigator's interpretation of the data, as encyclopedic information, careers, human resources, peers and superordinates, policies and budgets, and change initiatives. The way in which the investigator characterized the contexts is specific to this study and was used only for reporting purposes.

A critical notion to this theme is that most of the decisions the respondents made have a human-resource component. A pure scientific perspective that examines decisions as being void of a human element, is unrealistic to investigating this study's research question. The respondents held the view that acknowledgment of the human-resource component was essential to their decision making.

To characterize the contextual theme, as has been done for this study, has a limitation. By pointing out a context for each problem, injustice is done to providing an accurate account of what the respondents experienced. The reader ought to be aware that a particular decision that is associated with, for example, the context of policy, may be misrepresenting the actual events of how implicit knowledge had been employed. That decision could have been referenced with another context. In other words, if the decision involved a teacher then the investigator could have selected the context of human-resources. To avoid cross referencing,

Table 7-1

The Contexts and Incidents in Which Implicit Knowledge Was Employed As Reported in the Study

Context	Incidents
Encyclopedic Information	-Private life -Community and public relations (Note: how implicit knowledge is used changes with context)
Careers	-Personal careers --entering education --entering the principalship or transferring to another principalship --entering a potential district office position -Other people's careers --reassigning teachers --hiring teachers --assessing teachers --renewing teachers' contracts; placement of teachers --assessing support staff; releasing support staff
Human Resources	-Teachers --empowerment --disciplinary matters --conflicts --reading of individuals or groups -Students --disciplinary matters --mark appeals --reading of individuals or groups -Parents/guardians --parental involvement in school matters; issues concerning their sons/daughters

Table 7-1 (Continued)

Context	Incidents
Peers and Superordinates	-Peers --principals and vice-principals -Superordinates --district staff, superintendents, and board members
Policies and Budgets	-Policies --board policies and school policies, --unwritten policies, board and community pressures -Budgets --shadow budgets and school budgets; setting priorities and forecasting needs (Note: involves the human-resource component)
Change Initiatives	-Timetabling --planning the forthcoming year --instituting a new timetable (Note: involves the human-resource component) -Other initiatives --reorganizational and restructuring (Note: involves the principal's vision for the school)

which is laborious reading, the investigator has assisted the reader by heeding warning of this limitation.

The Contextual Use of Implicit Knowledge

The respondents were well aware of examining a decision in terms of isolating it in a particular context. A comment made by Paul during the case study interview best summarizes this awareness.

> When I look at something, I don't look at it from a very parochial and narrow perspective but from a larger perspective. Part of that is . . . an understanding of the [total] context. . . . I think it is important to have awareness of all the things around it. . . . I don't feel as comfortable doing things that I think are de-contextualized because to me I lose something. I don't understand it. It has no context for me. (P3: 10-11)

As with the other themes, respondents had difficulty providing information to questions that focused directly on the contextual theme. Most of the data related to the contextual theme came through the respondents' incidents and by letting the respondents talk about their implicit knowledge experiences.

Encyclopedic Information

When the investigator asked the respondents to describe those circumstances in which implicit knowledge functions best (see Appendix A, question number 8), they provided a limited amount of detail. For Paul, it worked best in handling people. He suggested, "It doesn't work well if the expectation of the decision is . . ., what would one say, administrivia" (P1: 13). Bill claimed that there was a human-resource component in most decisions "to the extent of how it is going to affect people" (B2: 21). Tom originally felt that as he gained more experience, he was more likely to use less implicit knowledge. He suggested that this "seems almost the reverse of what one expects" (T2: 17). The investigator thought that Tom had more to say on the issue and probed Tom's response. Tom contended that what he originally said was true but further claimed, "I probably

. . . implicitly do things that I don't even know that I do because of all my experience" (T2: 19). In his response, Fred provided an incident involving a policy issue relating to students' behavior on a ski trip. Gerry stated that it worked in decisions that are "human-resource oriented" (G2: 20). He also suggested that most decisions have a human-resource component. He talked about a budgetary incident in terms of "technological support for the classroom" (G2: 20-21).

Other information appeared in comments that had been elicited using probing questions. Tom talked about whom he approached as apprizers, and how implicit knowledge was used and gathered, was dependent upon the context. Bill explained that the process for making a decision was also dependent upon the context, especially in terms of "key stakeholders" (B1: 9). He stated that he brings "to every decision the students' interests, the board's interests, and the teachers' interests. . . . the whole picture" (B1: 25). Bill further mentioned that the principalship was "a very people-oriented business" (B2: 40). Fred and Gerry had similar comments to make. Gerry stated that school administrative decisions

> have to be made, partially, with the view to the impact on the children in that classroom where that teacher is going to be: whether the teacher gets the resources to work with or gets an attitude boost; . . . to go in there and do a good job, or whatever. (G1: 14)

Fred claimed:

> Since we are in the people business most of the things that we deal with, especially the nasty decisions, tend to relate to people in one way or the other: students or staff. It just seems like we are constantly stuck with having to make hard, difficult, miserable decisions about a fraction of our students and a fraction of our staff. (F2: 31)

More information regarding the contextual theme came through incidents described by the respondents. Information elicited and associated with the community and one's private life were mentioned infrequently. They are, however, worth pointing out. The investigator assumes that under different circumstances, these would have been mentioned more frequently.

Implicit knowledge was found to be used in incidents involving the community. Fred talked at length about the press coverage received from the criminal case concerning the young male shooting the young female. Tom also used implicit knowledge for public relations purposes. In one incident, Tom decided to stop sending the school newsletter home with the students. Instead, he bought space in the local newspaper. The change was very successful and, in Tom's opinion, has added credibility "because it is now not a propaganda sheet--it is in the [news]paper" (T1: 9). The reasons for making this decision were based upon Tom's impressions that the newsletter was not being delivered by the students. These impressions were later confirmed by a survey.

Tom was the only respondent who talked in detail about using implicit knowledge in his private life. This information indicated that there was a close link between how Tom viewed his use of implicit knowledge on a personal level with how it was used in administering the school. He specified: "I operate the same way. I don't think I assume a role when I come here [to the school]. I think I am myself" (T1: 30). He indicated that his wife, and perhaps other people, think he is impulsive. But he advised that this was unfounded because he will take a particular decision and spend a fair amount of time collecting relevant information. He spoke of a personal incident where implicit knowledge, in part, was employed to purchase and sell a car. As with his educational decisions, he used both analytic and synthetic skills. He did research on which car to purchase and the price for which to sell his old car by looking at used car publications and talking with people. Tom debated, within himself, the price at which he should sell his car. He alluded to the possibility that he listened to the salespeople rather than his implicit knowledge. He stated, "I had a gut feeling that I made a mistake" (T1: 21) when the car sold. He felt that he could have received a higher price. As it turned out, the dollar concern balanced itself when he purchased a vehicle for under the market value.

Careers

Personal careers. Tom and Bill spoke of using implicit knowledge in personal career decisions. Tom claimed that implicit knowledge was involved in his decision to leave his corrections career for teaching and, later, for entering the principalship. Consciously, he thought he would get better holidays as a teacher; however, he was unable to recall any further specifics. Details were provided when he talked about his move into administration. Tom claimed that as a classroom teacher he had misunderstood that he would have been unhappy if he had continued teaching because he was constantly being critical of how schools were being administered.

> I look around and I see that somebody is leading our school, or making decisions, and think that I can do a better job of that. I would make that known. I guess, somewhere along the line, without saying it in so many words, I [implicitly] heard someone say, "So, if you are so damn good why don't you do it?" So I did. (T1: 39)

Tom also provided a current personal career decision. During the weeks that spanned the interview sessions he made the decision to apply for a transfer to an elementary school. When the investigator asked Tom to talk about the implicit knowledge that he employed, Tom claimed that it had been some time since he had been a principal of an elementary school and felt that "it wouldn't be a bad idea" (T2: 12). He suggested that it was about time that he reacquaint himself with the elementary level if he wished to pursue a district staff position. Such comments have a trace of implicit thinking. More to the point was Tom's feeling about the move. Tom felt good about the decision and brought forth the idea that he was "comfortable" (T2: 12).

Bill's description of how implicit knowledge was used to assist his career revolved around the modeling of one of his school principals. Bill said that he entered the field of education to become a principal. He stated that "as a student in high school, I modeled myself after the principal. That is where I began to learn about this job. I eventually got to what I always wanted to do" (B3: 2-3). These comments, like Tom's, have a trace of implicit knowledge. The investigator was unable to determine how much of the modeling aspect influenced Bill's career pattern. What is known, is that his career pattern was based partially on implicit knowledge.

Other people's careers. The respondents (knowingly or unknowingly) determined or influenced (directly or indirectly) other people's careers while employing implicit knowledge. Bill spoke of an incident involving a member of the support staff. This incident occurred early in Bill's career and involved the release of a caretaker. Bill collected information from apprizers regarding the caretaker. He was unable to specify what these individuals were like, but he did say that "there were key people in . . . [his] mind" (B2: 18). And the reason for that is "they have implicit knowledge as well" (B2: 19) which he valued.

Respondents spoke of incidents revolving around teachers' careers. Gerry mentioned the incident where the counsellor who held a Doctor of Philosophy was reassigned to the mathematics department. Gerry's words describe the events, which are worth repeating: "The whole exercise was not very factual business. . . . It was a matter of impressions and . . . almost feelings about what was happening rather than documentable kinds of stuff" (G2: 2-3). Bill spoke of renewing teachers' contracts based upon "who is fitting in and who isn't" (B2: 16), and not assigning teachers to a particular course because they "just don't look right" (B2: 23). Fred used the metaphor "a coin toss" in describing what he does in selecting between two candidates who are equally qualified for a particular teaching assignment. Most of the respondents spoke of hiring people based on implicit knowledge that was gathered through the reading of the individuals and determining if they would fit into the respondents' visions of the schools. Fred held the view that when hiring

> one is, in fact, going by a lot of intuitive knowledge, a lot of implicit knowledge. It is a gut feeling about a person: " Should I hire you? Will you fit in on the staff?" These are gut feelings in many ways. (F3: 25)

Sometimes, as was illustrated in the hiring incidents provided by Tom, the wrong decision was made because of being inattentive to one's implicit knowledge or abilities.

The respondents provided an extensive amount of information regarding the employment of implicit knowledge when formally or informally assessing teachers. From one perspective these assessments have the potential to affect a teacher's career. Bill claimed that implicit knowledge is used "when you observe teachers and students interacting" (B3: 9) and wondered if he could measure that objectively in terms of good and bad interaction. Fred drifted from policy items to questions that were "probably not too useful because they certainly . . . [were] not fulfilling the requirements of the policy very well" (F3: 15)--the questions were more oriented toward his vision of what classrooms should be like at Livesay Senior Secondary. Fred further used a grade 12 student survey, given out at the end of the graduating year, to informally assess the positive aspects of the teaching staff. Students were asked: "Are there people on staff . . . that have particularly helped you?" (F2: 22). Fred felt that he received honest answers because students had "nothing to gain or lose" (F2: 23). He further suggested:

> They have anonymity, and I know anonymity has some weakness as far as getting answers from people. I have always found that I could sense a ring of truth, somehow or other, by how much effort the person put in. If they answered these [pointing to the first set of questions on the sheet] with some kind of apparent integrity, then I have to believe this is meaningful. . . . There is some integrity to what they said; that is useful information. (F2: 23-24)

Fred articulated, to a certain degree, the process he employed to bring together and cross reference information elicited from students so as to make an informed judgement of the comments that were passed on to teachers. In Fred's explanation, there was an apparent amount of connectivity involved in this process that appeared to be implicit.

Human Resources

Comments and incidents elicited from the respondents where implicit knowledge was employed in the realm of human resources were classified as being associated with teachers, students, and parents.

Teachers. The majority of information that was elicited revolved around teachers. As Tom highlighted halfway through his second interview, "I listen to myself as I answer these questions and it is funny how they all centre [on] . . . staffing" (T2: 17). Paul mentioned working with teachers and claimed that he used implicit knowledge to empower people. He referred to doing this in terms of his coaching metaphor: "There is a lot of reinforcement, there is a lot of empowerment, and there is a lot of individual leadership that I give to people: 'Take it. Use it. Have it'" (P3: 35-36).

Gerry claimed that the knowledge that he used in decisions was influenced from what he had "experienced . . . on the job" (G1: 3), from having "a feeling for where the staff would like to go with an issue" (G1: 2), and "what I think is, or what I interpret to be" (G1: 3). In a parental complaint regarding a basketball coach, which had "all the makings of . . . ethical charges" (G3: 14), Gerry had no way of knowing where to begin to take action. He said, "I suppose I went through a debate process with myself as to which step to take first" (G3: 15). Gerry rationalized after the fact to approach the child first so as to get "an idea of what the child perceives the real problem to be; not the third party, namely the parent" (G3: 15).

Bill and Tom talked about a host of incidents revolving around teachers, most of these have been mentioned. Bill valued being able to assess moods and to "sense that there is a problem very quickly" (B2: 36). There were two incidents involving teachers that were described by Tom which have not been reported thus far. One had to do with a teacher that could have been charged with sexual harassment in the classroom. Tom claimed that he "sensed that there was a pretty strong feeling" (T2: 22) on staff against sexual harassment and that it was perceived to be a problem. Tom began to handle this concern by contacting staff members regarding their opinions on whether sexual harassment existed in the classroom. He did this without telling them about the teacher in question. As a result of the interviews, Tom's "sense" was confirmed and he pursued the issue. The other incident involved Tom realizing that the information used to solve one problem was applicable to a second problem. Tom had a "gut feeling" (T1: 7) that things were not right with the teaching and support staffs. At the same time he was building a case for his low increase in administrative allowance in the previous contract settlement, compared to the substantial increase given to principals of schools of comparable student enrolment. During this process the issue in both problems became clear; there was a connection. In brief, he determined that Pratt Senior Secondary had a high teacher-student ratio and a low amount of secretarial time compared to other schools in the district. From this he established that the contract was unfair because it was based on the number of teachers rather than student enrolment. In regards to the "gut feeling," Tom ascertained that the teaching staff and support staff were overworked.

Fred described a number of incidents involving teachers. A comment by him summarizes why implicit knowledge is important to solving problems that involve teachers (part of the comment was reported in the previous chapter and is applicable to this section).

> The diciest thing one does . . . involves personnel, whether it is students, parents, teachers, and so on. This is, probably, where we are the most poorly trained on a formal basis. That is, there are very few, if any, courses available that give you some idea of how to deal with . . . conflict resolutions and so on. There is very little out there that tells you how to deal with a teacher . . . [who] is going through divorce . . . and how that has spilled over into his or her work situation. (F1: 8-9)

As Fred mentioned, personnel not only includes teachers but students and parents. These two groups compose the remainder of the human-resource context.

Students. Paul provided the incident of approaching the student in the hallway because "there was nothing outwardly different about her than there had been on any other day, except that something inside me sensed that something had changed in her eyes" (P2: 14). Paul also mentioned the incident where the student was being charged with a criminal act and he sensed that having the student go through "public floggings or any other things that are obviously big in this situation" (P3: 28) was inappropriate. In reference to the last incident, Paul suggested that when discipline decisions are handled through policy there can be a conflict with his implicit knowledge. In Paul's words, "It just doesn't feel right as opposed to the feeling that you get when you have done something . . . that is right" (P2: 6).

Gerry made similar comments regarding students and unwritten policies in reference to retention. He mentioned that there was pressure from the community, district, and ministry to keep students in school. For Gerry, to retain some students was difficult because retention was considered not to be in the best interest of the student; under these circumstances Gerry claimed that he had received "a physical signal" (G1: 24), an uncomfortable feeling.

Bill's incident with students being lured into the parking lot illustrated how implicit knowledge indicated to him that this was not a problem. Bill also believed that implicit knowledge was useful in sensing problems, "especially with kids" (B2: 36).

Tom mentioned that the barometers he reads for gathering information also includes students. Two incidents involving students that Tom provided included the 12 students that placed graffiti around the school and the vicious fight where the one parent was going to lay assault charges. Tom claimed that in both incidents the process for making the decision was unclear and that implicit knowledge was of assistance.

Fred talked about a variety of incidents that involved using implicit knowledge with students: one was in reference to limiting the number of potential paper airplanes during a school-community assembly; another was related to Fred's reactions being interpreted as appropriate by the students that observed him as he looked at some graffiti; and others were concerned with mark appeal cases. For Fred these incidents were often more than the original problem. He suggested that actual problems are uncovered "as you peel away the layers" (F2: 32) of the students. Many of the incidents focusing on students also involved parents or guardians.

Parents. Fred spoke at length about employing implicit knowledge in mark appeal decisions to obtain a "balance" (F2: 7) by using his "sense of fairness" (F1: 10). At these times, his decisions had to take into consideration parental involvement and perceptions.

Though Tom provided limited details regarding parental involvement with the 12 students that placed graffiti around the school, he did mention it in the vicious fight incident. The reader should recall that Tom was uncertain how he was going to solve this problem and that it was implicit knowledge that assisted in developing a process. As a result of that process, the boys' mothers ended up speaking to each other.

Bill mentioned parents in some of his incidents, but the link between implicit knowledge and the parental context was unclear. His views, however, were articulated in his comments. He was of the opinion that implicit knowledge was employed in quick decisions involving parental concerns.

> I think in talking to parents, and in crisis situations, that you have to make decisions very quickly on how you are going to present the argument. . . . Those are interesting times when you . . . don't have time to think about what you have [to say]. (B1: 22)

Just as some of the human-resource incidents involved teachers, students, or parents, other incidents involved peers and superordinates.

Peers and Superordinates

Peers. Many of the respondents spoke of using their vice-principals as apprizers. Often these data lacked specifics. Details occurred more in descriptions of incidents involving other peers. Tom mentioned that he used "other principals as . . . barometers" (T1: 25) by taking an idea to another principal or to an administrative meeting. In either, he would seek reactions by doing a reading of the individuals or groups.

Paul claimed that he would often unconsciously provide people with metaphors. Paul stated: "I would decide to do it or not do it. But I would not necessarily be aware . . . [of] doing that. The metaphor probably would just occur, and I would unconsciously decide to use it" (P3: 17). Paul spoke of an incident where he did this to a colleague at an administrative meeting. The other principal said something about students with which Paul strongly disagreed.

> I immediately converted what they said to a metaphor of my own. Then I credited it to them, as a paraphrase, but it was still a metaphor for what they said. I enjoy doing that. . . . They are going to remember their metaphor, not mine. . . . I also use it because something inside me tells me that if I don't use it people are not going to understand what I am trying to do or say. (P2: 31)

Superordinates. Just as Bill mentioned that implicit knowledge was employed in quick decisions when talking to parents, especially in terms of "how you are going to present an argument" (B1: 22), he said the same with "decisions when the Board wants an answer right away" (B2: 8). In these circumstances, Bill explained that the experience of "I've been here before" (B2: 8-9), has a major role on how he is going behave.

Gerry mentioned that he did not often make many wrong or bad decisions when implicit knowledge was employed. He claimed that when he does they are usually associated with someone in the system, be they a peer or superordinate, where he has grown tired of maintaining a relationship. Gerry had this to say about what he needs to do in such incidents:

> Occasionally I make bad decisions and I have to go back and fix them. I suppose going back and fixing them is just the opposite, that's a good decision. I can't think of a case where I haven't been able to make it work. In fact, sometimes it works so well that having made the bad decision in the first place may have been a good decision because the other person wants to recover so badly that you get more than you would have otherwise. Funny business, isn't it? (G1: 16)

In Paul's incident where the student was alleged to have committed a major offence and where Paul recommended to the superintendent that he avoid having the student go through any "public floggings" (P3: 28), much of what occurred in the meeting with the superintendent was implicit. "What I said to the superintendent was not really conscious. I didn't sit down and think, 'Should I really do this?' I just did it. It was very intuitive" (P3: 28). The respondents also provided incidents where the human-resource component was accompanied by other entities such as policy issues, budgetary concerns, and change initiatives.

Policies and Budgets

Policies. A finding that has been reported, is that of policies coming into conflict with a respondent's implicit knowledge. Respondents described incidents where implicit knowledge had to be employed in policy making. Bill provided an incident where a designated area for smoking had to be found as a result of the board passing a motion that smoking was to occur in certain areas on school property. Bill explained that an area was found based upon his experience and knowledge of the school and community. Bill admitted that there was no model or process in place to carry out this decision. At best, there was only "an idea of what you want to do and where you want to go" (B2: 6). In Bill's description of how he carried out this process, there were tinges of implicit knowledge being employed; but, these were next to impossible to report as a result of a lack of detail.

Gerry was also involved in a smoking policy related decision. The policy was enacted at the school level. What led Gerry to this decision were the staff members who were extremely bothered by the smoke in the staffroom. Gerry pointed out that he introduced a process to eliminate smoking in the school building. He claimed that he initiated a number of conversations on the topic, and then went about establishing a process. Gerry had difficulty articulating the implicit parts of this process. He suggested, "Whether or not that was employing [knowledge that was] implicit or explicit, or a combination, I don't know" (G2: 5).

In describing and commenting on another incident involving an unwritten form of policy, Gerry was able to be more precise. He suggested that knowledge of the system was important to many of his decisions: "I have to keep abreast of what is happening politically and economically" (G1: 3). He also mentioned that knowledge of the community was important. He claimed that knowledge of the system and community was based upon his experience and could be gathered through implicit processes. Furthermore, implicit knowledge was used to determine when a solution to a policy issue was reached. As an example, Gerry sensed that he had to begin to work on improving attendance at the school due to community and system pressures--an unwritten policy. He involved a variety of stakeholders in the decision-making process. Gerry knew when a decision was reached as a result of the "mental comfort" (G1: 7-8) that he had received.

Budgets. Information elicited showed that the respondents thought they used implicit knowledge in budgets because of the human-resource component. Gerry mentioned that most of the decisions he made were "human-resource oriented" (G2: 20). He spoke of an incident of purchasing computers for the classroom. Gerry hinted at the fact that, since the decision involved "improved technological support for the classroom" (G2: 20-21), there would be some implicit knowledge used in making that decision.

Bill was more pointed about the human-resource component. He realized that in setting budgetary priorities he sometimes makes "somebody happy and somebody not happy" (B1: 18). In two budget related incidents, Bill mentioned the people affected by his decisions. He recommended: "With budgets it is a good idea to save money. . . . You can always work out a table for those things, they're quite easy[,] . . . but it is also human resources" (B2: 20).

Paul brought forth the notion that budgets require forecasting needs for the next year, if not for future years. He advised that

> there is that sense, which you are not always conscious of but because you are thinking about it in another realm--the implicit or unconscious realm--that you are actually planning . . . [within] certain limitations. . . . So, I think, if you have any kind of

> vision, or sense of the philosophy or direction of the school, your budget is going to be one of the tools that is going to get you there. (P1: 13-14)

Change Initiatives

The respondents spoke of employing implicit knowledge in changes that were in the process of being implemented or were recent. The respondents provided incidents of major timetabling changes or preparing the timetable for the coming school year. Other changes mentioned revolved around programs that were aimed at achieving a respondent's vision for the school.

Timetabling. Bill, in explaining the process he used for changing the timetable from 20 periods per week to 24, was unable to articulate the implicit knowledge that he employed. What he did say was that there was no one model he used to make the change. Furthermore, he acknowledged the human-resource component when he mentioned that the stakeholders were taken into consideration.

Tom also realized the human-resource component when he wanting to change the timetable to shorter periods. He stated, "I knew [what was needed] because I was going around observing classes and looking at the teaching and at the same time getting a feeling about what was happening in these classes" (T2: 5). Tom pointed out, "I did not use entirely . . . an explicit decision-making process--it was mostly implicit" (T2: 6).

When Paul made decisions regarding the timetable for the coming school year, he viewed these decisions much like budgetary decisions. He felt that implicit knowledge was used in timetabling because of the human-resource component.

> I think it [implicit knowledge] is, seems to be, used wherever people are involved. It seems to me that you can make an arithmetical, numerical, kind of connection with something like a timetable . . . to make it make sense, . . . all the numbers add up. The dimension that is missing [is] . . . "Who are they for?" The implicit knowledge, the intuition, comes through in that light: where you begin to see the space[s] as being occupied by

> people. . . . There is something that happens so that you begin to look at it as real people, with real things happening. (P2: 28)

Other initiatives. Information elicited regarding the use of implicit knowledge in change initiatives was often oriented towards achieving each school's vision, or a respondent's vision for the school. A content analysis of the incidents that Bill talked about showed that he used implicit knowledge in this way. A comment by Bill, though brief, is straight to the point: "I think . . . I always had a sense of where I was taking the school, the whole picture. I think that is what you need. You need a sense of what is important" (B1: 17-18).

A content analysis of the data suggested that Fred took the vision for the school into consideration and that this was often done implicitly, and that improving student performance was an essential component to Fred's vision of the school. Comments by Fred also suggested that he had more than the immediate problem in mind when solving a problem. For example, Fred felt he had a sense of what was important and what was fair. These were important to administering Livesay Senior Secondary and to the image of the school's administrative office.

Information elicited from Gerry indicated that he was a principal who made changes by implicitly taking into consideration the bigger picture for the school. As an example, Gerry had to find a way to prevent young visitors, non-students, from coming to Munro Senior Secondary during school time. He took a number of actions to detour the unwelcome visitors: to name a few, the smoking area was eliminated except for lunch time and before school; the cafeteria was closed during class time; and the supervision of the cafeteria area focused on maintaining a quiet atmosphere. In Gerry's view: "It was a direction that I wanted to go. Whether or not I initiated that thought [the direction] at that point, I don't know" (G2: 10).

Paul spoke about change initiatives in an enthusiastic manner. He agreed that his decisions are, at all times, shadowed by his vision of the school. The shadowing has become part of an implicit process, the coaching metaphor: "Looking at the whole thing and then going back and knowing; sensing that this is where you ought to be. Then going back and picking out things, you know, and doing it that way" (P2: 22). In response to telling if a particular decision is going to be right or wrong, Paul stated:

> Part of it is, if there is a fit. Not only a fit in terms of that particular decision, but does that decision fit into other decisions? Does it seem to be a consensus point of view? Does it seem to be moving in a certain direction? For example, I'm often asked to make a decision of something that is going to affect the school. One of the criteria I will use for fit is, "Is this the way I will describe a quality school initiative?" I do this because I have tried to define the school I am in as a quality school. Part of the process then would be, "Is this what quality schools are all about? Does it fit that particular concept of quality that I'm trying to build, that I'm trying to encourage?" (P1: 6-7)

Tom, like Paul, spoke with an enthusiastic spirit about a number of incidents where he used implicit knowledge in change initiatives. Tom felt that his decisions must "fit your [his] vision" (T2: 26). Furthermore, the changes must be carried out in reference to his vision. Tom stated with intensity:

> In terms of a vision, as to where we're going, we can't get there fast enough in this school as far as I am concerned. I think the traditional 25 or 30 kids facing the same direction, looking at the backs of heads with one person facing another direction looking at them, should have been out a long time ago. . . . And the more varied that we can make the process, the better. The equation is that we've a varied product, we've got a standard process, and we get varied results. And I want to see this varied product be able to have varied processes that they can go through so that we can have a guaranteed result; so that everyone can succeed. . . . We've got to make kids more responsible for their learning as opposed to putting greater emphasis on teaching. That is what I am trying to do. It is all in

> the back there [Tom pointing to the back of his head]. (T1: 31-32)

Discussion

Findings from the contextual theme paralleled those in the literature review. A discussion focusing on each context would be repetitive in terms of the review; however, there are findings that are worth highlighting. A content analysis indicated that the respondents were very much aware that implicit knowledge assisted them in administering their assigned schools in an effective and proficient manner no matter the context, especially in terms of implicitly employing their vision for the school.

Implicit knowledge was found to be employed in problems concerned with careers. As indicated by the research by Wagner and Sternberg (1985), implicit knowledge was used to manage oneself, as in Tom's incident of selling and purchasing a car; one's own career, as was illustrated with information elicited from some of the respondents; and managing others, as was the case with all the respondents. Unique to this study, in relation to managing others, was the finding that implicit knowledge was also used to manage, intentionally or unintentionally, other people's careers.

The majority of information elicited was associated with the human-resource context. Most of the incidents involved teaching staff as opposed to the majority stakeholder, the students. The investigator attributes this to a methodological issue, and with each respondent's role within their assigned school. With the methodological factor, the incidents described by the respondents were recent or current. With the role factor, student problems were assigned to other administrative staff or to counsellors; the respondents tended to handle issues related to the teaching staff.

The investigator found that the respondents were unable to provide direct information regarding the contexts in which implicit knowledge was employed. Generally, they provided incidents or what if examples. This phenomena is in keeping with the computer literature on eliciting knowledge from experts. What has been found is that experts, when asked how they solved a problem, would give an example (Berry, 1987; Dreyfus & Dreyfus, 1986; Simon, 1989). Moreover, the respondents described each incident with a particular, personalized passion. In the investigator's observation, this was sometimes done with gusto, at other times it was done with sensitivity, spirit, or enthusiasm, and so forth. From the investigator's point of view, this could be interpreted as the respondents carrying out each decision with the same fluency and consideration, no matter the context.

The notion that context may influence how people process information and arrive at decisions has generally been accepted. Krager and Brown's (1992) statistical study was able to measure this influence. They concluded that problem context was "associated with differences in information used" (p. 129). The findings of this theme were in keeping with this notion, which showed that the respondents used knowledge differently depending upon the context of the problem. Usually the difference was associated with the human-resource component. A content analysis suggested that the employment of implicit knowledge was more prevalent in human-resource problems than in budgetary problems.

Findings from the functional and contextual themes, when viewed in conjunction, suggest that some decisions have elements of symbiosis. In policy problems involving people, especially student discipline, respondents indicated that the relevant policies would be interpreted, as suggested by English (1992), in an arbitrary way. This process entailed, for example, doing what was beneficial for the student, thus indicating that the policy was working as intended. From one perspective, both dissimilar entities (the student and the policy) benefited from each other. Symbiosis was also found to exist in timetabling decisions. Paul suggested, as did other respondents, that implicit knowledge was used when "you begin to see the space[s] as being occupied by people" (P2: 28). Thus, a particular timetable ought to only exist if it benefits the people affected.

What was found in this theme, but lacked discussion in the literature, were two findings: one, a respondent was able to make use of an apprizer's implicit knowledge; and two, a respondent was able to use information that was gathered in one problem-solving situation and implicitly make the connection that the information was valuable for solving another problem. Either finding could have been ignored if an examination was carried out to formalize the knowledge or to frame the knowledge in a particular context. In their works on computer expert systems, Dreyfus and Dreyfus (1986) and Simon (1989) pointed out the difficulties with codifying such knowledge or abilities. The notions of utilizing other people's implicit knowledge and the connectivity in people thinking processes require attention. Recent work in computer research, especially with parallel thinking (Wiegner, 1992), indicates that the challenge to formalize such implicit knowledge or abilities is being undertaken in terms that knowledge (process) is far from being context specific.

CHAPTER 8

The Enhancement of Implicit Knowledge

Introduction

In this chapter the reader is provided with a discussion of the confines of examining the enhancement of implicit knowledge as they related to this study. Next, the findings of the enhancement theme are outlined. These are followed by a discussion of the theme.

Confines of Examining Enhancers

During the pilot the investigator uncovered information that was related to this theme and suspected that details and specifics would only be elicited from the respondents by probing. Moreover, information would have to be gathered within the boundaries as defined by the respondents' perceptions of the topic of how implicit knowledge was enhanced: these may include, to name a few, their awareness of what they do in this realm; their comfort in discussing the issues revolving around the topic, because many issues could be ascertained as being too personal; and their beliefs about implicit knowledge in terms of cultural barriers.

As with the other themes, information related to this theme emerged during the first interview. The enhancement information was sketchy in comparison to the other themes. Respondents alluded to activities they did which enhanced or developed implicit knowledge. (In this study enhancement also includes development.) The investigator decided, after an analysis of the first interviews, that more information would only come about by probing during the second and third interviews. As a result, some information came from incidents that the respondents described while the majority came from responses to the probing questions. Two questions were asked of all respondents. One focused on particular methods that respondents used to help them draw upon implicit knowledge; and the other revolved around regular activities that were practiced and helped to develop implicit knowledge (see Appendix A, questions numbered 9 and 10). Early in the study, the investigator found that some of the respondents were reluctant or unable to respond to these questions. The investigator assumed that this was because they were uncomfortable or unfamiliar with the topic. The investigator continued probing sensitively and found that the respondents considered the topic to be challenging and fascinating.

The information that was volunteered with limited probing was usually related to experiential enhancers: the notion that there are practices and behaviors that enhance implicit knowledge through experience. Specific information was elicited through probing questions. The investigator realized that some of the respondents were unable to talk about other enhancers that were prevalent in the literature: namely, relaxation and analytic activities. The investigator sought another avenue for collecting this information: questions were developed that were related to the routine activities of the respondents. An analysis of this information found the link between these activities and the enhancement of implicit knowledge to be weak. They were considered potential enhancers/routine activities. Other information emerged that was not associated with potential enhancers/routine activities or with experiential enhancers. For reporting purposes, this information was classified as miscellaneous enhancers. (See Table 8-1 for a sample of the enhancers and activities.)

Enhancers of Implicit Knowledge

Experiential Enhancers

Throughout this study reference has been made to the notion that experience is closely associated with implicit knowledge. What emerged from the enhancement theme was that there were enhancers that were affiliated with experience. How this enhancement occurs may itself be implicit. Though some of the information that is mentioned in this section has been cited elsewhere, a different vantage point (namely

Table 8-1

A Sample of Experiential Enhancers, Potential Enhancers/Routine Activities, and Miscellaneous Enhancers of Implicit Knowledge As Reported in the Study

Item	Enhancer or Activity
Experiential Enhancers	-Experience (honing) -Listening -Reflection -Introspection -Visualization -Learning from others -Awareness (trust)
Potential Enhancers/ Routine Activities	-Meditation -Driving -Golf -Running -Walking -Small business enterprise -Writing (journals and files)
Miscellaneous Enhancers	-Focus on work -Patience/stress -Surroundings (solitude and morning thoughts) -Interaction with others (conferences)

that of enhancing implicit knowledge) illustrates the applicability of this information to experiential enhancers.

Bill felt that people have to "hone" (B1: 17) their implicit knowledge or, more specifically, "intuition based on experience" (B1: 17). He pointed out that it gets developed over the years, and he was certain that it was more developed while administering Mowat Senior Secondary than it was in his earlier days of administration. In commenting on implicit processes, Gerry believed that these were developed through "experience" (G1: 11). Like Bill, Gerry felt that he was much better at using these processes than when he had first started out as a school principal. Fred suggested that the enhancement of implicit knowledge was a subjective, learning process. In reference to fairness and justice being applied, he submitted: "I think I have thought about that part of it more. In my own mind, I have sort of articulated that more clearly to myself than I have done before" (F2: 10). Fred also described how he handled the graffiti incident where students were observing him: "I guess from my perspective, it is knowledge from what I have seen in the actions of others, and from when I have been caught in these things myself" (F1: 21). Tom spoke about learning to read people from Mrs. Crane: "How do I do it? I don't know, but it is intuitive" (T1: 24). An analysis of the information suggested that Tom picked up the ability through a number of encounters with Mrs. Crane: "She taught me how to . . . read people because she did it to me" (T1: 23).

Another enhancer that is related to experience, and to interacting with people, is that of listening. In response to questions concerning listening, Bill said he thought he was recognized as a fairly good listener. Fred contended that his staff viewed him as good, but he felt he wanted to be better. Tom claimed that he had had to learn to become a good listener. In an incident early in his education career with a student, which he described as the turning point in becoming a good listener, Tom was told by the student that he had not listened to what he had to say. Tom admitted: "I found that I tended to do a lot of the problem solving before I listened. I attempted to predict what they [people] were going to say . . . I didn't listen" (T3: 6). Tom finds now that he sits back and works hard at being a good listener and that more problems are cooperatively and effectively solved. He is careful not to impose his own ideas on someone who is trying to share a problem with him. He stressed that he can now listen and proceed through a problem without fear of the unknown. Tom explained, using a golf analogy: "[It is] the old golf theory again[:] . . . When you know the water is there you tend to be cautious. But if you don't know that it is there you proceed without fear" (T3: 8).

Gerry was more precise regarding the development of his listening abilities in terms of enhancing implicit knowledge. He contended that he was "not a good listener" (G2: 13). When asked if the staff at Munro Senior Secondary would agree, Gerry suggested: "I try not to be a poor listener. . . . I take time to hear people; to talk with them when they want to talk. Actually, I think maybe they might feel that I am a fairly good listener" (G2: 35). He further claimed, "The time when I make most of my decisions" (G2: 13) is during conversations with people. Gerry provided some hint that this is when his implicit knowledge is enhanced.

> When I am troubled about something and I am trying to work it through, I frequently interact with other people: not necessarily about the decision, I may skirt the issue, I . . . don't necessarily ask their opinion of a specific thing; but I know that I very frequently seek interchange with people when I am trying to make decisions. . . .
>
> I think what happens, probably, is that, I am no different from anybody else; we probably just keep churning all the things that we have to churn. At some point, the right slot comes along for each decision, and we make no decisions before their time. (G2: 13-14)

From one perspective, Gerry enhanced his implicit knowledge by listening in an internal way as opposed to a more overt one.

Fred and Bill spoke of visualizing decisions as a way of enhancing implicit knowledge. This is similar to Paul's coaching technique of creating a picture for team members or staff members. Visualizing was often done unconsciously, and carried out automatically, as part of the process for arriving at a decision; which is an indication that experience contributed to its employment. Bill stated:

> I think I . . . [live] a lot of the discussions before I make them. I go over a lot of things in my mind. Sometimes, when I am not sleeping at night I'll do this. . . . When I am doing it, it seems like . . . I practice it. It seems like a first time trial. (B2: 26)

Though Bill was unable to directly explain the link to implicit knowledge, Fred did. He said it was experience, and visualizing himself in situations of being a student or teacher, that permitted him to see problems by drawing upon the "corner of your mind" (F3: 6). He later referred to this, in an adaptation of the adage, as placing himself "in the shoes of the person or the people" (F3: 11). More specifically, Fred indicated that he did not have "a standard set of tricks" (F3: 9) for doing this. In reference to written communication there was a trick he used. Fred found word processing to be an inhibitor to implicit knowledge. He specified that with a "tough" (F3: 10) composition, "I like to write [it] by hand and give it to my secretary to type. I then have the ability to read it as though somebody else wrote it" (F3: 10).

Paul considered awareness, in terms of trust, to be an enhancer. He claimed that his experience with implicit knowledge as a teenager and an adult taught him about "trusting your instincts, trusting your ability to read a situation and to make a decision" (P2: 21). He proposed that using implicit knowledge was like

> being street smart in lots of ways. . . . Having to be resourceful with yourself. Trusting yourself in certain situations, especially in dealing with other people; being able to read those people, counting on your reading of people in order to survive. Those roots are really powerful. (P2: 18)

The respondents commented on reflection and introspection as enhancing implicit knowledge. Though they were not asked if these were conscious or unconscious practices, the investigator inferred from the content analysis that they could be employed on demand or implicitly. Moreover, either practice was something that was developed over time. Bill, Gerry, and Tom's information on these enhancers lacked detail; however, their comments provided insight into the enhancers and the difficulty associated with examining them. Tom viewed reflection and introspection as forms of meditation or thinking. He suggested that he was introspective as opposed to reflective: "I really don't learn from the mistakes that I make. I make the same ones over and over again. [Laughter]" (T3: 9). With probing, Tom agreed that the practices of being introspective or reflective had similar features. Gerry affirmed that he was reflective and introspective to some extent. In reference to the latter, he stated, "If I was extremely introspective, I suppose, I would have considered a lot of these things that we [Gerry and the investigator] are talking about: I would have sat down and puzzled through how I make decisions" (G2: 36). Based upon the information elicited from Gerry in the other themes, the investigator considered that both practices occurred on a regular basis and were indeed enhancers. Bill confirmed that he often visualized incidents and that this was a form of reflection where he "would be looking back" (B2: 27). Introspection for him, "would be looking forward, anticipating a conversation within me" (B2: 27). This view of introspection is in keeping with Bill's notion of living or rehearsing actions.

Paul held the view that time to reflect was a technique that was useful for drawing out his implicit knowledge. He had a well-defined view of reflection as an enhancer. Like Tom, he equated reflection with meditation (see the next section, Potential Enhancers/Routine Activities, for details). Paul's reflection was a scripting process.

> It is like writing or creating a picture. Putting down all the things that I know about it [the problem], then wiping it off and redoing it. I do that in the morning when I am planning my day--writing everything down in my head. I have to do this. Then I throw it out. Once I have done that, I am ready. (P2: 33)

Fred considered himself to be both reflective and introspective, and considered these traits to be enhancers. He claimed, with an element of self-awareness:

> I really enjoy thinking about issues. I enjoy thinking about the thinking process: how people come to be what they are, and who they are. And I guess, with that, I am interested in myself as well. I enjoy . . . thinking about why I did something. (F2: 2)

Fred described, and often reflects on, an incident which involved a teacher who had been given quite a bit of bad news over the year and whom Fred described as an intimidating kind of person. At the end of the school year Fred, normally the bearer of bad news, left informing the teacher of a change of assignment to two vice-principals. As it turned out, the teacher never received the bad news. The teacher never said anything for three months. At this time, the teacher approached Fred and said that he was disappointed in him. Fred was disappointed in himself and second guessed a number of events that should have occurred. Much of Fred's description of this incident revolved around Fred's examination of his mental and emotional states. Such reflection and introspection is in keeping with his response to how he views the two enhancers.

> [Being] introspective is sort of looking into one's self: questioning and weighing and trying to understand one's own . . . [motives] and strengths and weaknesses.

> I think reflective . . . is not as inward looking. [Being] reflective means trying to look at all factors, not just the internal ones. So [being] introspective is the examination of self as opposed to [being] reflective which is the examination of everything that is possible . . . in connection to a decision. (F3: 24)

Much of the information regarding experiential enhancers was diverse and to some extent personal. In the next section, the information is more personal. The reader will be shown that this information relates to respondents' routine activities and can only be considered, as best, potential enhancers.

Potential Enhancers/Routine Activities

The majority of information for this section came from respondents' comments in response to the investigator's probing questions. Little information came from incidents. When the respondents were asked if they regularly practiced an activity that helped to develop implicit knowledge, most responses were sketchy. When Fred was asked the question, his response was apropos of the study and most of the respondents. He stated, "You're on, what is to me, unexplored territory" (F3: 11). Through an exploration of the respondents' routine activities a strong link could not be made to the enhancement of implicit knowledge. The one exception was with meditation, and this was only possible with some of the respondents.

All the respondents made comments regarding meditation. Paul was the only one who claimed that he followed a formal technique or school of meditation. Bill, when asked if he meditated, responded by suggesting that he did not follow a formal technique, and that he had developed his own form. The only detail that he provided was that he did a lot of thinking, reflecting, and rehearsing when driving; no association as an enhancer was made. Tom explained that some of his meditation occurred late at night and early in the morning.

> [I meditate] between 11:00 at night and 2:00 and 3:00 in

> the morning. I think that is probably the result of the fact that I don't think about things when I am walking home; I don't think about things when I am walking to work. And I don't talk about work at home. That's not normal. That's not even healthy, I don't think. As a result, I think it all has to come out; and it does at night and in the morning. I think a lot about that stuff then and solve a lot of the problems. . . .
>
> I think in a lot of cases what happens is that I continually think of the worse case scenario in my meditation, in my thoughts. And that spurs me to action. And the action I find, when I finally go to do something about it, wasn't as bad as I thought it was. (T2: 25)

Tom's comments regarding his meditation have shades of being an enhancer. His concern about his lack of thinking about work on his way home, and lack of talk about work at home, was more normal than he thought.

Gerry claimed that he seldom talked about work at home. His time spent driving to work included "reviewing the things that would be challenges across the day" (G2: 29). On the way home, school was not on his mind: "Going home, I am probably thinking about the grandson, . . . the evening. This is not deliberate, it just works that way" (G2: 29). When asked if he did anything that may develop his implicit knowledge, Gerry talked about how he goes about interacting with people. When the investigator asked if there was anything he does internally, he responded point blank, "I don't meditate" (G2: 25). When asked what he does on a regular basis, he spoke about working in a small business enterprise. Gerry explained that during this time he thinks about school.

> We [the staff] are attempting to move to a different structure for . . . [the students]. Those are the kinds of things I think about. How to rearrange the plant. And thinking about the politics of getting that done.
>
> I guess, now that I am thinking about it and getting into this, maybe I think through how I am going to work with someone. How I might get the superintendent to buy computers for the school. . . How I might help a teacher to feel some urgency to improve some aspect of delivery.
>
> I don't know if the solutions come. . . . As I said

> before, "We process no decisions before their time." . . . It requires a certain amount of thoughtful organization before decisions are made. And that is a good place [the business] for me to do it. (G2: 26-27)

Though Gerry's comment regarding his thinking while working in the enterprise is more oriented towards a place where implicit knowledge would be employed in problem solving rather than a place to enhance it, to separate the two would be difficult. The enterprise appears to be an environment which facilitates drawing out implicit knowledge.

Fred stated that he did not meditate but did qualify his statement: "I don't have a mantra. . . . But I think, I would like to believe, that I think a lot" (F3: 11). Like Gerry, he thought about school while driving to work, but not on the way home, and seldom did he talk about school at home. On the way to school his thoughts were about, "the toughest things that I know I have to do that day" (F3: 12). Earlier he indicated, "On the way home, I think about family things and what I am going to do that evening" (F3: 12).

Paul practiced a formal technique of meditation and claimed that it was like scripting. He said that he did meditate every day. "It started with TM [Transcendental Meditation], but that has evolved to something I do. It is scripting; then blanking out; and then looking at the same script to see if it is different" (P1: 15). In brief, TM is based on the doctrine that reality is discovered by studying the process of thought that emphasizes the senses (intuitive) above the empirical. Paul specified:

> I will focus. I move my eyes. Think. I also will doodle, draw things. I think, I would try to impose something else first, so that I can push out something that I already know. . . . What I don't want to happen when I make decisions, is that I don't want to be blocked by one idea.
>
> Lots of times what will happen, if there is not a currency about what I have to do, is I will go through an experience that has been . . . catalogued. I don't

> forget many things that I have experienced, gone through, or read. . . . It is catalogued. The things that are most current, are the things that happen first. For example, if . . . I see a problem[,] the most recent idea is the first thing that pops into my mind, my head. It is not the only thing I know, but it is the first thing that is there. It is on a more conscious level. If I don't like it then I have to get rid of it. So I take it out. I do this to get rid of it--knowing that it is not the answer; knowing that it is not the solution; knowing that it is not what I want to do. . . . This is a process that happens occasionally. . . .
>
> The other thing I try to do is find a little bit of time.
>
> . . . Get some sense that I don't have to make this decision right away--escape the urgency; . . . to get in touch with it; . . . and to get some room to maneuver. (P2: 29-30)

Paul's comments suggest that his meditation practices have assisted in heightening his awareness of his abilities. More recently, Paul had begun to practice Tai Chi: a form of exercise that concentrates on physical movements, in the hopes to further enhance his implicit knowledge. Paul has started this for two reasons: "I want it to give me greater concentration with my meditative powers. I also want to use it to relax" (P2: 32).

Respondents talked about a number of other routine activities. These included golf, running, and writing and journal keeping. Fred and Tom spoke of golf as an activity where they seldom thought about work. Just as Tom claimed that he never thinks about work when walking home, Fred emphasized: "I don't do one particular thing to get away from work. I don't have a lot of difficulty creating that distance. I have trained myself to do that; or maybe, it's a natural tendency" (F3: 13). Bill mentioned that he jogged and played golf. No detail was elicited regarding his jogging; however, he indicated that when he was on the golf course, his mind was on work.

Writing and journal keeping (also meaning files that are referred to on a constant basis) were activities that were also mentioned by the respondents. Paul claimed that he enjoys writing, but stated: "I don't like to write personal things down. I never write personal things. . . . I don't trust the mechanism. If it is here [pointing to his head], I have control of it" (P2: 34). Tom also did not keep a journal. As for files, he would only refer to them for "personal professional information" (T3: 3). Tom claimed that he had a good memory for retaining personal information. Gerry kept a journal. He had to force himself to write in it and found that he would go for days without making an entry. He also kept a personal file which he would refer to on occasion. Gerry claimed, "I get a picture [from the journal and files] of my own growth and development, or my thinking, as it changes over time" (G2: 34). As previously mentioned, Fred used the writing process to draw upon implicit knowledge. He would get a secretary to type a written composition so as to distance himself from it. Fred did not keep a journal: "I have a daytimer and write some ideas in there. But I don't . . . make a point of keeping a journal" (F3: 22). Later, he claimed that he only looked at the daytimer for "when something may have happened . . . ; not for what . . . [he] was thinking at that moment" (F3: 22). Bill did not keep a journal but indicated that he doodled a fair amount, both pictures and "written doodles" (B2: 30) or notes. Bill showed the investigator four pages of notes he made while listening to the State of the Union Address by the United States President, George Bush. Bill stated, "Now, why did I do that?" (B2: 29). He specified: "I write everything down as the days go through. I have it all filed away. . . . Sometimes I go back through it [the files] to see where I was at that time" (B2: 39). In addition to these potential enhancers/routine activities and the experiential enhancers, the respondents spoke of other enhancers.

Miscellaneous Enhancers

The respondents spoke of stress related constructs in relationship to enhancing implicit knowledge, or as it relates to hindering it. Gerry brought forth the notion that he is focused at work when making decisions. "These decisions, I don't think, are hugely stressful things to me. If they are, they are only stressful until six o'clock, or so, because after that. . . . " (G1: 22) he goes home and feels he can distance himself from school related items. Gerry further mentioned how, over the years, he had learned to be patient with the implicit processes associated with making decisions.

> I had to bridle my impatience. . . .
>
> The patience or impatience has to do with just a feeling of urgency, to get on with the job. If there is something to be done that you know needs to be done, it is difficult to wait three weeks or six months to get that job underway. If it is to work better for a longer period of time, and done carefully, then you must be patient. (G1: 12)

Tom claimed that he is a morning person and is at work by six in the morning. He has found that his best solutions or thoughts come early in the morning. He suggested that this was when he was relaxed.

> I have my best thoughts, and I come up with my best solutions, between 2:00 and 4:00 am. I will actually wake up. I have in the past . . . written them down. I have written my graduation speech over three nights lying in bed. . . . It all crystallizes, even the words I want, at that time. I am not asleep but I am so relaxed . . . I am thinking . . . clearly. . . . When something is bothering me, . . . it eats at me at that time of day. . . . That is where I'll come up with solutions. (T1: 22).

Bill advised that "you do handle things differently when you're stressed more" (B2: 9). He agreed with the investigator that when people feel relaxed they are better able to use implicit processes. Bill also viewed feeling good about oneself as being important to enhancing implicit knowledge.

> I think, just sometimes, you are in a good space. . . . I have had a lot of good things happen to me [recently]:

> I was on the convention board last week, and it was really successful; I was at a meeting last night that was good. Sometimes, it is hard to say why you are up. . . . Sometimes, you have a lot more self-confidence that what you are doing is right. . . . It is at those times that you feel more comfortable in making implicit decisions. (B2: 25)

Being in a "good space" (B2: 25) was referred to by other respondents in terms of their surroundings. Generally, the respondents felt they could draw upon their implicit knowledge in most surroundings and that solitude was an enhancer. Paul mentioned that time to reflect, and access to information, were important in his decision making, as was "a solitary environment" (P1: 21). He also referred to having "time alone" (P1: 15) as being essential to drawing out his implicit knowledge. His training in formal meditation techniques may contribute to him being able to be alone on demand. Paul claimed he does and can "go into isolation anywhere" (P2: 32). Fred found his office at night time to be a conducive place to make decisions. He would often go home and return to school to do some work. During school, Fred may go to an empty room: "I have a couple of empty corners, empty rooms, that I occasionally go to if I am composing something that I think is very difficult. Or if I just need some time to really sit and think about something" (F3: 11-12). On occasion Gerry does think about work at home. When he does he blocks out people that are around him. Gerry said, "My wife has to keep interrupting me to have a conversation because I start thinking about school as I have my first cup of coffee" (G2: 27-28). Thoughts have also come to Gerry as he is getting ready for the morning.

> The other morning, I was sitting on the side of the bed. I had been interrupted getting out of bed by some thoughts about what I was going to do that day at school. I probably spent five or 10 minutes sitting there, in that interrupted state, and came to a conclusion of how I was going to handle a certain situation. (G3: 22)

The respondents further felt that being around other people enhanced implicit knowledge. Fred and Tom mentioned using apprizers as enhancers. Tom claimed that sharing a decision before making it public, "sometimes in a covert way and sometimes in an overt way" (T2: 21), gives him time to read his apprizers. Fred spoke about sharing ideas with colleagues, the vice-principals in the school or other principals in the district, as part of the enhancing process. He said the discussions are often frank.

> I generally trust their judgment, [and] they trust mine. If there is a thorny issue I will call one of them and say, "This is what's happened," without giving names. "This is what I'm doing. Tell me where this is going to create some grief for me." They do the same with me. (F2: 25-26)

Bill claimed that many of his best decisions are made at conferences. His words best describe the experience.

> When I go to a conference, sitting down with a pen in front of me and listening to the person, I look at my school. I can see things really clearly. I can, I think, then make a lot of decisions of what I am going to do. I can do these things if I am far away from the school. . . .: get into a good, proper, atmosphere. . . . Maybe the speaker is talking about decision making, maybe he's talking about leadership . . . and you pick up a few things that cause you to think about what you are doing.
>
> I think it is really important for a person in my position to get away, to do these things, to have the opportunity to reflect back on what you did, what the situation is, and what you're going to do. I found that I have made a lot of, I think, sound decisions that way. (B2: 27-28)

Gerry made a fair number of decisions while interacting with people. He claimed, "I frequently interact with other people: not necessarily about the decision, I may skirt the issue" (G2: 13) and "churn" (G2: 14) the ideas until "the right slot comes along" (G2: 14). The process, however, does not begin here. One thing Gerry does so that he is successful with this implicit process is that he tries to make people feel comfortable about the interaction.

> One of the things I try to do is, I try to make the people who work with me feel comfortable in being frank, forthright, that there isn't any risk in discussing problems, seeking solutions, or even giving input in the decision making. If that risk is low then I have access to some good input. I think that you can tell when people are comfortable, and being forthright and frank. . . . When that happens, of course, you feel more comfortable with what you have. Your decisions ought to be better. (G2: 24)

Discussion

Information which was elicited and linked to enhancing implicit knowledge was interpreted by the investigator as experiential enhancers and miscellaneous enhancers. Information which was considered to be potential enhancers/routine activities was not usually able to be linked to implicit knowledge. As with the other themes, the findings from the enhancement theme generally paralleled those findings in the review of the literature.

In keeping with Schon's (1983, 1987) writings on the reflective practitioner, the respondents did a fair amount of thinking on their feet: Schon's (1987) reflecting-in-action. They further did some thinking about their reflecting-in-action. Schon (1987) pointed out:

> Reflection-in-action is a process we can deliver without being able to say what we are doing. Skillful improvisers often become tongue-tied or give obviously inadequate accounts when asked to say what they do. Clearly, it is one thing to be able to reflect-in-action and quite another to be able to reflect _on_ our reflection-in-action so as to produce a good verbal description of it; and it is still another thing to be able to reflect on the resulting description. (p. 31).

As was reported in the previous thematic chapters, and as suggested by Schon, the respondents had difficulty articulating their experiences. The enhancement theme was no exception.

At the beginning of this study, the respondents alluded to activities and behaviors that enhanced implicit knowledge; however, the investigator had difficulty eliciting further information. To overcome this difficulty the investigator probed for details and specifics. The investigator used information from the literature which suggested that there were routines that enhanced implicit knowledge. In taking this avenue the investigator was able to elicit data regarding potential enhancers or the routine activities of the respondents. Unfortunately, the link to implicit knowledge was seldom mentioned by the respondents; nor was the investigator left with the impression that the respondents were convinced that these activities enhanced their implicit knowledge. The one exception was Paul, who met both of these criteria. Some well-defined descriptions or incidents, as those elicited from Paul, would have been sufficient to meet the criteria. The finding of the potential enhancers/routine activities raises a future research need which revolves around the confirmation of this link. In keeping with the literature, the investigator has assumed for the remainder of this discussion that these routine activities are at best potential enhancers.

The investigator had to work within the confines related to the examination of the enhancement theme. Initially, discomfort was sensed in the respondents' responses. As the study progressed, the respondents provided thick, meaningful information. The discomfort appeared to be associated with the respondents' lack of awareness of how their implicit knowledge was enhanced, and the respondents' perceptions of the nature of implicit knowledge which were defined by cultural barriers. Details of these perceptions are reported in the next chapter, The Meaning of Implicit Knowledge.

The enhancement theme showed that the respondents did not do any one specific activity to enhance their implicit knowledge; even Paul suggested that he did more than meditation. Nor were there any specific circumstances that contributed to the enhancing of implicit knowledge. The descriptions of enhancers were diverse and idiosyncratic.

As an example, golf was an activity that some of the respondents mentioned: Bill thought about work while golfing, while Fred considered the activity to be an opportunity to get away from work.

The respondents also spoke of enhancers as being related to isolation and stress. Not only was interaction with people important, but so was isolation. Closely related to being alone, or in isolation, is relaxation. Respondents spoke of having patience and not being stressed. Krager and Brown (1992) proposed that "reflective administrators should be aware of the presence of stress and how it affects their decision-making [_sic_]" (p. 130). The respondents were very much aware that external pressures cause stress and affect their decisions. In addition, they were aware that implicit knowledge assisted in, to cite Krager and Brown, "counteract[ing] poor decision-making behavior patterns provoked by stress" (p. 130). As an example, the respondents were aware, as mentioned in the functional theme, that implicit knowledge was used to make a decision when there was a lack of time.

Generally, the respondents were able to talk extensively about experiential enhancers. With these enhancers, the respondents mentioned the importance of experience in enhancing or honing implicit knowledge. An interesting finding that related to the experiential enhancers, was that the respondents spoke of learning implicit processes from people. Specifically, some people were used as enhancers in the developmental sense. Interacting with people was also a miscellaneous enhancer. In reference to apprizers, they were further found to have an enhancement role.

CHAPTER 9

The Meaning of Implicit Knowledge

Introduction

This chapter provides the reader with a discussion on delving into the respondents' meanings of implicit knowledge. The findings related to the theme are reported, followed by a discussion of the theme.

Delving Into the Meaning of Implicit Knowledge

The investigator found that two of the six pilot participants, both males, were reluctant to talk about their implicit knowledge experiences. Another participant, a female, had difficulty providing details about her experiences but spoke about employing implicit knowledge constantly. These findings parallel those found in the literature. To report the pilot findings in this way is to oversimplify the information collected and to convey a stereotypical impression in regard to gender. What the findings illustrate are the parameters in which implicit knowledge has been discussed in the literature. A review revealed that it has often been examined using various attributes, such as gender. Studies have ignored, to a large extent, the meaning which people have attached to implicit knowledge and their ability to articulate that meaning. Other information elicited from the three pilot participants provided another finding. An analysis indicated that the participants were unable to articulate their implicit knowledge experiences because they had deliberated on them in a limited capacity.

The respondents, unlike their three pilot counterparts, were more lucid and willing to talk about their experiences. Nevertheless, there was a challenge associated with examining the respondents' experiences; this was to go beyond what the respondents understood about implicit knowledge from the literature and other sources. To meet this challenge, information was sought which was based upon the respondents' experiences and which contained data related to the meaning that each attached to implicit knowledge. Relevant information was provided by most respondents early in the first interview and before the probing questions were used. The respondents were also asked to respond to a word association exercise during the second or third interviews--more specifically, they were asked to associate the following words with implicit knowledge and respond with whatever came to mind: skepticism, rejection, comfortable, trust, confidence, faith, and risky. Some of the responses were one word, while others involved one or more statements (see Table 9-1 for a summary of responses).

The Meanings Attached to Implicit Knowledge

Most respondents' comments related to the meaning theme, and which were made in the first interview, were statements directly associated with their views of implicit knowledge. Tom's view was unspoken and inferred from the information that related to his experiences. The respondents' views were volunteered and for reporting purposes were considered pre-probing information. Other information was elicited through the investigator's probing questions.

Pre-probing Information

Halfway through the first interview Bill spoke of using apprizers' implicit knowledge. In reference to Sister Theresa, he said, "I may not go along with her, but I certainly trust her" (B1: 13). Bill also spoke of unconscious knowledge in terms of experience and informed intuition. Bill proposed that only some people have informed intuition: "It is something you have or don't have. I think it would be hard for some people to develop it" (B1: 16). Bill felt he had it and had always had it.

> Maybe it is part of my upbringing. We had to often make, when my dad was away, some very big decisions at a very young age. I had responsibilities put on me very young. I think it is intuition based on experience. I think that you hone it. (B1: 17)

Table 9-1

A Summary of the Responses to a Word Association Exercise That Delved Into the Meaning That Each Respondent Attached to Implicit Knowledge

Word (Respondent)	Response
Skepticism	
Bill	I'm not skeptical of it.
Fred	I am skeptical about our ability as humans to understand everything.
Gerry	No.
Paul	Healthy.
Tom	No.
Rejection	
Bill	No, I won't reject it.
Fred	There is an uncertainty, I guess; but I wouldn't reject it outright, I'd listen to it.
Gerry	No.
Paul	Accept.
Tom	No. Very much accepted in my mind.
Comfortable	
Bill	Yes, undoubtly. I like to move when I am comfortable with it.
Fred	Yes, I am comfortable with implicit knowledge.
Gerry	Yes.
Paul	Very.
Tom	Yes.

Table 9-1 (Continued)

Word (Respondent)	Response
Trust	
Bill	Yea.
Fred	Yes, I guess with the skepticism in mind.
Gerry	Yea.
Paul	Absolutely.
Tom	Great trust in it.
Confidence	
Bill	Yea. I have a lot of confidence with it.
Fred	Most people are much less confident with it than they appear to be. . . . And I am one of those people.
Gerry	Yes.
Paul	Very.
Tom	Yes.
Faith	
Bill	Yea.
Fred	I do have it with implicit knowledge. It is sort of more of an acceptance than of faith.
Gerry	That may be going a little far.
Paul	What it means to you.
Tom	Put it this way, when you don't have a heck of a lot of other resources to draw on then you better . . . have faith in your implicit knowledge.

Table 9-1 (Continued)

Word (Respondent)	Response
Risky	
Bill	Yes, it can be.
Fred	Absolutely.
Gerry	Not really.
Paul	Interesting.
Tom	I don't know if you want to equate risky with excitement. If in fact we are looking at it as risky, I find it exciting too. . . . To challenge that particular belief and faith of implicit knowledge that I have, and know that it is right, then have confidence in it. . . . It is exciting to do that all the time.

Fred suggested that the unconscious knowledge he employed was based upon experience and "a personal philosophy" (F1: 5), such as a sense of fair play. Information associated with Fred's meaning came through an incident in which he described receiving a signal that indicated to him that he should follow a particular action. When asked if this signal was a mental or physical sensation, he spoke of intuition. Fred did not deny that intuition may have had a role in the decision and qualified the information with his view of intuition: "I don't think I am sufficiently intuitive, innate by nature, to pick up subtle signals. I don't think males are very good at this anyway. Certainly, I don't fancy myself to be very good" (F1: 12).

Gerry responded to the first interview question by stating, "I don't necessarily think back to a class, How to Make a Decision 201" (G1: 3). He pointed out that he reaches a comfort level when he has correctly interpreted what apprizers are saying. Gerry viewed this as a process which becomes automatic and "part of your vocabulary" (G1: 18). After all, as Gerry recommended, "Can you think of a situation where you employed only explicit knowledge?" (G1: 16-17).

Paul claimed that most of the knowledge he employed was unconscious, be it truly implicit or declarative at one time, or acquired through an implicit process. He alluded to the notion that there was little difference between unconscious knowledge and intuition. He also talked about a sense of rightness. Paul indicated that he was beginning to understand what he meant by intuition and rightness: "I think I'm beginning to learn how to be a little more explicit" (P1: 8) about their use. He considered that implicit knowledge was used in conjunction with the rational process and claimed, "I don't think I feel uncomfortable with it . . . because it is practiced in teaching all the time" (P1: 13).

Compared to the other respondents, Tom's view was elicited in an indirect way. The meaning he attached came through his unspoken words and his nonchalant comments. He spoke of implicit knowledge as though it was common place in his practice. A part of the first interview illustrates his meaning: "So, is it fair to say that I looked at it analytically and then used, not always, . . . a gut feeling? And I had a gut feeling about this too. Somehow things just weren't right" (T1: 7).

Other information related to the meaning theme emerged as the respondents were asked the probing questions. Some of these questions were intended to have the respondents expand on statements that they had made. Other questions, developed from findings related to the literature review and the pilot, sought additional information.

Probing Information

The majority of information related to the meaning theme was elicited using the probing questions. The responses will be reported under headings that are related to an assortment of views, to the issue of secrecy, and to the word association exercise (see Table 9-1).

Assortment of views. The meaning that the respondents attached to implicit knowledge covered an assortment of views. Only that information which best captures the respondents' meanings will be reported. There was some consistency, as well as diversity, among the views.

For Fred, articulating his employment of implicit knowledge for this study was unsettling.

> I know that I am not giving you very good answers here because it is very hard to articulate. This is something that most of us, if we have discussed it at all before, have never really discussed in any kind of disciplined way. (F2: 42)

If Fred meant that "we" referred to other principals, two other respondents had similar observations related to thinking processes. Paul stated:

> Principals never talk about these things [implicit knowledge experiences]. Principals talk about problems; principals talk about difficulties; principals talk about barriers; and principals talk about money, but they don't talk about decision making. . . . They share frustrations that they think everyone else has. But they don't share personal frustrations very well, or very often. (P3: 23-24)

Gerry realized his colleagues never talked about their thinking processes, and was uneasy about how he made decisions in comparison to his view of how his colleagues did.

> I find so often, quite often, that I am going a different direction from most people. I have often wondered about that a little bit. We did a thing in one of my Ed. Admin. classes. What we were doing was analyzing ourselves. What kind of administrator are we or how do we deal with people: was it a humanistic- . . . or task-oriented approach? I was completely opposite to the whole class. . . . That is a little worrisome, you know. You don't quite know how other people think. (G2: 17-18).

The respondents had something to say about analytic or scientific models of thought. Tom, in the case study interview, was asked if he used a check list. He responded by suggesting that "the check list idea is awfully analytical. I am not analytical" (T3: 29). He said that what he does was best explained using incidents. After describing these, Tom claimed that what he had done "just made sense" (T3: 34) and that he "didn't even know where it [the process for solving the problems] came from" (T3: 35).

Where some principals question the use of implicit knowledge, Paul was cautious about non-implicit knowledge.

> [I think there are] a lot people out there who. . . . are highly structured. They see management as a science and a series of practiced skills that can easily be learned and inculcated, and would not give any credence--would not give, I guess, any value--to the idea that experiential reflection and intuition have any real value. (P3: 37)

For Fred, working through mark appeals using mathematics is a "narrow perspective" (F1: 14). He viewed himself as a judge in these appeals--which involved "peeling [away] the layers" (F3: 20) of people.

> I enjoy thinking about the thinking process: how people come to be what they are, and who they are. And I guess, with that, I am interested in myself, as well. I enjoy, and do it--thinking about why I did something--perhaps more from an intellectual as opposed to an emotional point of view. I am not a very emotional person. (F2: 2)

Though Fred thought about thinking processes from an intellectual point of view, he did acknowledge his use of implicit knowledge. Fred felt that reading people was a major part of his job and that he was somewhat successful with it because "getting to this job and surviving in it indicates some success" (F3: 19). In reference to intuition, Fred felt his skills were underdeveloped.

> I am being sexist here. I believe that women have better intuitive skills; . . . and a better sense of the unwritten, the unspoken, the unstated. . . .
>
> Mine [intuitive skills] are poorly developed, I think, in comparison to my wife. I know they can be an advantage. I know that she can come to a staff party and she can learn more and sense more about the staff in a two hour wine and cheese than I can by working with these people. I understand, in all my readings now, that this has become identified as a sort of male-female issue--that somehow it is different between the sexes, a characteristic. (F2: 40)

Fred's acknowledgment of implicit knowledge, in intuitive terms, was viewed by other respondents as trust. Paul suggested that trust was important in using implicit knowledge and that this "is how street people survive" (P2: 21). He claimed that he used implicit knowledge for administering Gustafson Senior Secondary on a daily basis and stated, "I would go with it more often than I would reject it" (P2: 29). Bill spoke of trusting his implicit knowledge in terms of the comfort that was associated with a subjective decision. For example, in determining the assignment of a teacher, a sense of comfort would accompany his decision of "'You just don't look right to me'" (B2: 23). Bill also brought forth the notion that trust was required in other people's implicit knowledge. He contended that it was "important to maintain trust with key people" (B2: 19) who were apprizers, such as Sister Theresa.

Secrecy. Another dimension of the meaning that the respondents attached to implicit knowledge was that of secrecy. Fred felt comfortable, especially in terms of a "coin toss" (F2: 35), in sharing the fact that implicit knowledge was employed in a decision: "If someone asked me how I arrived at a decision or why I did it that way--unless I am breaking trust with somebody--I just tell them" (F2: 34). He qualified this by saying that he rationalized the implicit knowledge, the coin toss, after the fact.

> I would be comfortable in saying that I had two choices and neither of them . . . were clear. . . .
>
> I don't really mind telling people that the decision was not easy, and that it could just have well gone the other way. (F2: 35)

Tom indicated that he generally found that he did not keep the use of implicit knowledge a secret. He claimed that he rationalized it after the fact. He agreed that he would tell people that he had a "gut feeling" (T1: 36) depending upon the people and the issues. For example, he indicated that he probably would not mention this to the superintendent because they informally talk about how things are going and rarely talk about "business" (T1: 38). Tom, however, stated: "With the assistant superintendent, I will mention that I have a gut feeling" (T1: 38).

Gerry proposed that he would rationalize most implicit knowledge after the fact, but claimed that with the vice-principal he would, if "sitting down to work on something, share [it]" (G2: 19) and feel comfortable doing that. Gerry agreed that he would say, "'It just doesn't feel right'" (G2: 19) to the vice-principal and, under certain situations, he would say the same to other individuals. At a staff meeting he would be "quite a bit more reluctant" (G2: 20).

Bill claimed that if his implicit knowledge was to be shared, he would rationalize it after the fact to most people, except those like Sister Theresa. Bill stated, "I think with individual staff members, ones I feel close to, I would [share it]" (B2: 12). With the staff, Bill was definite that he would keep it a secret.

> I think it would be more reassuring to them to think that I always make decisions with lots of information; that I don't make decisions on whims. Looking at it from their perspectives, they would like to think that I always make decisions by weighing everything carefully--pros and cons. (B2: 12)

Paul had views that paralleled those of the other respondents: "I feel uncomfortable letting other people know that . . . intuition was really important. . . . I would rather explain it after the fact, after I constructed some kind of model" (P2: 26). On the one hand he would not keep it a secret: "I have no problem with self-doubt. . . . I don't walk around with a heavy burden of self-doubt because I rely on implicit knowledge or unconscious knowledge. In teaching, it is more clearly understood than in other professions" (P1: 12-13). Paul explained the reasons for keeping it a secret.

> It is not so much as to keep it a secret as much as it is the high degree of trust that is required in being a principal. If you go around telling people that you have this feeling, or you get this feeling, it is a little nebulous. And you know it is. . . . If I was perceived by people as having a kind of intuition that was worth following then I would probably not worry about it; but, if I had never demonstrated that before, why bother?
>
> It is not really something that I . . . consciously hide. I do not go around saying that these people ought not to know this. But I don't go around flaunting it either. (P2: 24)

Paul spoke of the cultural expectations and barriers of being a school administrator in relation to employing implicit knowledge.

> The more responsible the position that you assume, the more people around you assume that you are totally rational. I think, power or authority of any kind really exists because it is rational. It is supposed to be above emotion; . . . it is supposed to be studied; it is supposed to be reasoned; and it is supposed to be all those kinds of things. Yet, I don't think a good practitioner is those things. I don't know very many that would tell you that it was a lucky, gut, whatever term they used, decision. . . . They would tell you that it was rational and how it was done. (P2: 25-26)

Paul's views, and those of the other respondents, were confirmed in the word association exercise. The intent of this exercise was, in part, to determine the trustworthiness of the responses, as well as to gather more information.

Word association. No new information was elicited using the word association exercise. From the results of the exercise, as outlined in Table 9-1, the following findings emerged.

The respondents indicated that they were not skeptical of employing implicit knowledge. And if they were, as Paul stated, it was "healthy" (P2: 34); or as Fred suggested, it may be related to "our ability as humans" (F3: 20).

In terms of rejecting implicit knowledge the respondents accepted or, at least, did not reject it. Fred claimed that there was some uncertainty associated with it, but he would "listen to it" (F3: 21).

All the respondents declared that they trusted, and felt comfortable with and had confidence in, implicit knowledge. There were some qualifications which are reported in Table 9-1.

In reference to faith, most respondents affirmed that this was associated with their employment of implicit knowledge. Gerry suggested that the word faith "may be going a little far" (G2: 33). Fred qualified his response by stating that "acceptance" (F3: 21) was a better association. Paul's response was vague: "What it means to you" (P2: 35). In the opinion of the investigator, Paul was referring to the notion that implicit knowledge was personal and that your faith was in specific notions associated with it, such as informed intuition, intuition, and gut feelings. To cite Paul: "The use of implicit knowledge may be an independent task thing, truly independent, [which] truly becomes your own. You can't always share that kind of thing" (P2: 28-29).

Responses to the risk association varied. Some responses referred to the level of risk, while others referred to the notion of risk. Paul's response, "interesting" (P2: 35), perhaps related to the risks or the challenges associated with implicit knowledge. Tom's response of "excitement" (T2: 23) pertained to the testing of and confidence in implicit knowledge. Gerry's response of "not really" (G2: 33), like Bill's response of "it can be" (B2: 39), was a recognition of some degree of risk. Fred's response of "absolutely" (F3: 21) was linked to his skepticism and corresponds to an acceptance of risk as opposed to its degree or level.

Discussion

Generally, the respondents spoke about the meaning they attached to implicit knowledge early in the interviews. The one exception was Tom. The meaning he attached was inferred from his nonchalant attitude and approach to talking about his experiences. Further information was elicited through probing questions and a word association exercise. The word association confirmed other information which was collected--no contradictions were found. For the most part, delving into the meaning of implicit knowledge was relatively easier than eliciting information for the other themes. This may have been because the respondents were able to give their opinions as opposed to recalling events. In addition, the topic may have become less foreign because a large portion of the data was elicited halfway, or more, through the interviews.

The respondents acknowledged that implicit knowledge was used in the decisions they made and spoke of experience as being crucial to the development of their implicit knowledge. They further suggested that implicit knowledge was used in conjunction with analytic and scientific approaches to solving problems. The respondents indicated that they were comfortable with how they used implicit knowledge for arriving at a decision. Any implicit knowledge that emerged in the process of solving a problem was not rejected: there was trust and confidence in it. These findings suggested that the respondents were aware that their analytic skills were supplemented with something else, namely, as indicated in other themes, synthetic skills.

The respondents were cautious with whom they shared their employment of implicit knowledge. There was a tendency to share it on an individual level, but they were careful in communicating this information on a more public level such as at staff meetings. If information related to implicit knowledge experiences was to be shared in a public arena, the respondents made it comprehensible, or rationalized it after the fact, so as to give the appearance that it was something that was derived from analytic or scientific means.

The respondents were willing to discuss the meaning they attached to implicit knowledge. A review of the literature suggested that cultural barriers might make people reluctant to talk about their experiences. Some cultural barriers did come through in the responses; however, each respondent realized the value of implicit knowledge. Any cultural barriers that existed were in reference to keeping the use of implicit knowledge a secret in a public arena. In this situation, the barriers appeared to be more oriented towards social expectations (external barriers), rather than something that was personal (internal barriers).

CHAPTER 10

Summary, Findings, and Interpretations

Introduction

The purpose of this chapter is to summarize the study and the findings. While the themes focus on particular aspects of the nature of implicit knowledge, interpretations of each respondent have been outlined to further assist in understanding the research question.

Summary

The Research Question

This study explored the nature of implicit knowledge of senior secondary school principals. The exploration initially examined the employment of the respondents' knowledge in the decisions they made. As information was elicited, respondents described implicit knowledge experiences. Further information regarding these experiences was elicited through probing questions. Six specific research questions were developed as the study unfolded. One question related to the elicitation of implicit knowledge and the others paralleled the five themes that emerged: structure, function, context, enhancement, and meaning. The information elicited was also used to form interpretations of each respondent's experiences.

Analysis of the Research Question

The initial analysis of the research question came from a review of the literature pertaining to the cognitive and computer sciences and the study of administration. The analysis continued as the study was conducted and the specific research questions emerged. The pilot and the ongoing literature review were useful in refining the research question.

The majority of literature on the elicitation of knowledge came from the computer sciences: more specifically, expert systems. Studies indicated that interviewing people about how they perform tasks is a wide-spread elicitation technique, as are running commentaries--asking people to explain how they go about solving problems so as to expose relevant attributes and their conceptual frameworks. Problems associated with eliciting knowledge included people having difficulty articulating their experiences, some knowledge being implicit, and formalizing implicit knowledge. Findings from the literature review suggested that people use something else besides explicit knowledge in their decision making. This something else has been referred to using concepts and constructs related to and including the terms common sense, intuition, practical knowledge, tacit knowledge, and implicit knowledge. The findings further indicated, that some implicit knowledge experiences can be detected and delineated, and this was confirmed by the pilot.

The ongoing review, which paralleled the themes, showed that implicit knowledge has a structure, a function, a context, is enhanced, and has meaning attached to it. The structure is the form and shape of implicit knowledge. The function is related to its operational dimensions, while context is related to particular areas where it is employed. Enhancement is associated with activities that develop, or draw upon, implicit knowledge. The meaning is the value the user attaches to implicit knowledge.

Studies conducted in administration have shown that administrators acknowledge the use of implicit knowledge. Writers have suggested that cultural barriers exist that inhibit people from talking about their experiences. A notion associated with implicit knowledge proposes that it is used in conjunction with explicit knowledge, and to separate the two impedes the understanding of administrator and organizational effectiveness.

Framework

The framework was used as a guide and evolved as this study was conducted. The operating definition of implicit knowledge was not imposed on the respondents. The respondents were asked how they employed knowledge in their decisions. As respondents described experiences, the investigator probed for details and specifics. At no time were the respondents requested to use the term implicit knowledge, or any other term. Respondents were encouraged indirectly to frame their own conceptualization of their experiences. In so doing, an idiographic body of information of each respondent was collected. Findings related to the specific research questions were analyzed using information that was found in the literature review.

Methodology and Research Design

The mode of inquiry used to conduct this study was from an interpretive perspective. This perspective was grounded in the assumptions of naturalistic inquiry and the theory of social interactionism.

A pilot of six school administrations assisted in establishing an initial research design and the interview questions. Information from the pilot was used to discuss the study's findings.

As the study was conducted the research design unfolded, and specific research questions were developed and refined. Saturation of information occurred with the five respondents who were selected from a purposive sampling of school principals based upon their reputation for being articulate and candid; the school level they administered, namely senior secondary; and geographic location, namely non-urban communities.

Data were collected mainly through three in-depth and semi-structured interviews. Other information came from school handbooks and records. A case study, or running commentary technique, was used to elicit further information. It proved to be of slight assistance in gathering new information, but useful in assisting to establish trustworthiness of the data.

A content analysis of the data collected was conducted as the study progressed. Initial impressions or interpretations were made from an early analysis of each respondent's interview. As the interviews were carried out and analyzed, patterns were uncovered. The investigator's journal proved useful in the analysis. Three interviews proved ample for redundancy of information elicited from each respondent to take place.

Findings

Most of the findings from this study were in keeping with the literature review. Since this study only included five senior secondary principals, all findings are intended to be situational. The findings, as they relate to the specific research questions, can be reported under the headings of the five themes and a sixth heading entitled implicit knowledge elicitation.

Structural Theme

1. Implicit knowledge was found to be used in administering senior secondary schools. The form and shape of implicit knowledge experiences were individualistic and multiple, and could be detected through structural cues.

2. Structural cues that were ambiguous and vague were considered generic, such as a sense of excitement or just knowing.

3. Structural cues that related to an understanding of a bigger picture were considered to be global in nature, such as having a sense of fair play and making an interpretation.

4. Structural cues that related to past experiences were considered to be *déjà vu* occurrences, such as having a sense of once being there.

5. Structural cues that pertained to one of the senses were considered sensational cues, such a voice inside or a physical or mental rush.

6. Structural cues that related to a particular concept or construct with a process orientation were considered to be metaphoric, such as flipping a coin or scripting.

Functional Theme

1. The functions, or operational dimensions, of implicit knowledge were numerous. Implicit knowledge was used for:

(a) Processing information. This included making quick decisions; collecting information; and determining missing links in problems, important decisions, and when to make a decision or let it incubate.

(b) Sensing problems. This included the identification of problems and actual problems, as well the anticipation of problems.

(c) Arriving at solutions. This included when there was more than one solution to choose from or when there was no apparent solution.

(d) Developing processes for arriving at decisions. This included when the process was unclear and there was no precedent process.

(e) Assessment purposes. This included evaluation and verification, selecting information, and assessing processes.

(f) Complementary alignment purposes. This involved issues of fairness, ethics, and expectations, to name a few. This function was shadowed by the uncertainty of ill-structured problems, determining important decisions, handling people problems, and risk taking.

2. Complementary alignment shaped decisions in terms of how the respondents perceived the principalship, as well as their understanding of the world around them. In addition, it involved the use of both synthetic and analytic skills.

3. Implicit knowledge conveyed information that could not be obtained through formal training. It also involved automatic processes. The employment of implicit knowledge was further found to be void of a model and was used in conjunction with analytic and scientific methods.

4. The respondents used other people in an apprizer capacity. Reading situations and apprizers, as well as experience, were related to developing processes for solving problems.

5. The respondents found that their implicit knowledge

came into conflict with policy, written and unwritten, and it was used to handle this conflict. More specifically, it was used to find balance in solutions. This included respondents exercising the arbitrariness and creative insubordination that accompanies their executive authority, as well as handling the adaptation and adaptability and the stability and flexibility which are characteristic of loosely coupled schools.

6. Implicit knowledge was made comprehensible to others, or rationalized after the fact, through an unidentifiable transformation process.

Contextual Theme

1. Implicit knowledge was found to be prevalent in human-resource decisions. It was used in the following contexts:

(a) Human resources. This included decisions related to students, teachers, support staff, parents/guardians, peers, and superordinates.

(b) Principals' private lives.

(c) Public relations.

(d) Careers. This included the respondents determining their educational careers, as well as other people's careers. In determining other people's careers, the respondents used implicit knowledge in reassigning staff, hiring, assessing staff, renewing contracts, and assessing support staff.

(e) Budgets and policies. The respondents often perceived decisions made in these contexts as having a human-resource component.

(f) Change initiatives.

2. Knowledge which was once declarative, or knowledge which was formalized, was used in a variety of contexts: for example, a respondent's vision for the school, knowledge of a person, or knowledge of a policy. In other words, a respondent did not have to go through a check list to employ this knowledge. It was used automatically and

spontaneously, without effort or premeditation.

3. The respondents realized that experience, in terms of knowledge base as opposed to years, was related to being proficient with implicit knowledge in a particular context. Furthermore, they carried out each decision, no matter the context, with fluency and due consideration.

4. The respondents were able to use implicit knowledge from one context and link it to another context through an implicit process.

5. Implicit knowledge was used in reading an apprizer's implicit knowledge.

6. Implicit knowledge was prevalent in decisions that have elements of symbiosis. These decisions revolved around issues such as student discipline and policy, or in timetabling in terms of student and teacher preferences.

7. The contextual use of implicit knowledge is as equally telling about the nature of the principalship as it is about implicit knowledge.

Enhancement Theme

1. The respondents seldom deliberated on how their implicit knowledge was enhanced.

2. No one specific activity was carried out to enhance implicit knowledge. Furthermore, the respondents were involved in a variety of routine activities, especially physical and mental activities. The routine activities could not be linked to implicit knowledge. The literature review indicated that they could be enhancers.

3. Experiential enhancers, the notion that there are practices and behaviors that enhance implicit knowledge, were crucial to learning and developing implicit processes. These enhancers included listening, reflection, introspection, visualization, learning from others, and awareness of implicit knowledge.

4. The use of implicit knowledge in terms of enhancement was related to solitude and relaxation.

5. Just as solitude was an enhancer, interacting with

people was also found to be an enhancer.

Meaning Theme

1. The meaning that each respondent attached to implicit knowledge was idiosyncratic. Delving into each respondent's meaning of implicit knowledge was found to relate to their respective biographies and was found to be bound by cultural barriers.

2. The respondents felt there was a lack of disciplined discussions with colleagues on notions associated with implicit knowledge.

3. Most of the respondents felt implicit knowledge was developed; one respondent felt only some people, contrary to the literature, were born with it.

4. The respondents were comfortable with implicit knowledge, trusted it, had confidence in it, did not reject it, and generally were not skeptical of it. Most of the respondents had an acceptance of, or a faith in, implicit knowledge; some found it risky or intriguing.

5. The respondents were reluctant to share their use of implicit knowledge with their staffs. If it was shared, it was only done with certain individuals. The respondents rationalized implicit knowledge after the fact or, made it comprehensible, if it was to be made public. It was rationalized as a result of the respondents' perceptions of the social expectations (external barriers) of their roles as principals, rather than personal or psychological reasons (internal barriers).

6. Respondents valued implicit knowledge being used in conjunction with analytic and scientific methods and explicit knowledge.

Implicit Knowledge Elicitation

Findings related to the specific research question regarding the elicitation of implicit knowledge were uncovered from an analysis of the information associated with the themes. These findings are in keeping with the literature review.

1. The respondents were able to describe structural cues associated with their implicit knowledge experiences. The investigator was able to detect and delineate these. Other cues were able to be interpreted by the investigator.

2. Descriptions of the structure of implicit knowledge, and related cues, were difficult for the respondents to articulate. The descriptions became easier to communicate when related to a specific experience or incident. Difficulty in articulating implicit knowledge experiences was compounded by a lack of vocabulary.

3. The respondents had difficulty articulating relevant information related to the functional theme. Data were indirectly gathered through the incidents they described. Details and specifics came from the investigator's probing questions.

4. Information regarding the contextual use of implicit knowledge came through the incidents described by the respondents, as opposed to asking them to recall the contexts where it was employed.

5. Most of the respondents had difficulty articulating activities that enhanced their implicit knowledge. Information for the enhancement theme came mostly from probing questions.

6. The meaning that the respondents attached to their implicit knowledge experiences was accompanied by the incidents they described. Further details came through probing questions, which also assisted in going beyond the respondents' understandings of popular conceptualizations related to implicit knowledge.

Interpretations

The reporting of the findings of this study have paralleled the specific research questions. This has provided a focus that is constricting. To broaden the reader's understanding of the research question, an interpretation of each respondent through the investigator's lenses will be given.

Each interpretation is intended to provide the reader with a form of pseudo-indwelling: the notion that the closest form of indwelling in a comprehensive entity, specifically each respondent, that can be achieved by the reader is through the investigator's interpretation. These interpretations illustrate a more authentic picture of what the investigator encountered with each respondent. Such an illustration would be impossible if this wholistic approach were omitted.

Highlighted in these interpretations are the thematic findings which are relevant to each respondent and which capture a respondent's implicit knowledge experiences. Other information has been cited which exemplifies what each respondent perceived as the value of implicit knowledge, either on a personal level or in global terms, in educational administration. The interpretations are not bound by absolutes, rather they are patterned by breadth and relativism. An analysis of the interpretations uncovered findings that are also related to the research question.

Bill

Bill, the oldest respondent, had been at Mowat Senior Secondary for 13 years. Retirement was planned in a few years. He had been an administrator for 21 years and a teacher for four years. Other work experience included farming and small business.

Bill believed that principals must be able to read people in order to lead. He thought about implicit knowledge in terms of subjectivism and informed intuition and felt that he had informed intuition. He suggested that only some people had informed intuition and that it was difficult for some people to hone. He felt that his implicit abilities had been developed at a very young age. Initially, Bill was hesitant to talk about his implicit knowledge experiences. As the study unfolded, Bill became more comfortable with sharing incidents. Bill was definite that he would only share the fact that he arrived at a decision using implicit knowledge with certain people; overall, he felt that he would have to keep this fact a secret from the staff because he perceived that they wanted to be reassured that a decision had been derived through an analytic or scientific process. A unique feature of the information elicited from Bill was that he spoke about using apprizers' implicit knowledge. Moreover, he trusted his implicit knowledge as well as that of the apprizers.

Bill would like to be able to talk more about the use of his implicit knowledge. He claimed that he found the study interesting.

> It is not often that you find someone who wants to listen to you, especially regarding some of the things we've talked about. . . .
>
> It is an interesting thing to think about how and why you make certain decisions yourself. It is a good exercise for me to talk about, to think about. It has been worthwhile for me. (B2: 46)

Fred

Fred, in his mid-fifties, had the most educational experience of the respondents: approximately 30 years. He had administered Livesay Senior Secondary for seven years and had had another six years of administrative experience. He also had had experience as a teacher and a college instructor.

How Fred viewed implicit knowledge was often communicated in terms of how he viewed the use of all knowledge--be it implicit or explicit. Though Fred claimed that he was skeptical of implicit knowledge, he listened to it and recognized the uncertainty that accompanied it. Fred came to accept and feel comfortable with his use of implicit knowledge. He would only share his experiences when they had been rationalized after the fact. Fred considered that reading people was essential and that intuition was a female trait which was underdeveloped in him. He believed that implicit knowledge was affected by professional readings: "I try to do as much [reading] as I can. . . . Some of it seeps in. It becomes part of your collection of what you might call attitude, wisdom, the whole thing" (F1: 22).

Fred suggested that implicit knowledge was often employed in the realm of the "authority of the office" (F1: 24), in his role of judge to determine fairness, and by arbitrarily interpreting policy. Fred inquired: "Have you dealt with any administrators who are essentially bean counters, who follow policy and say, 'If A then B'? Who then simply look it up in policy" (F2: 43). Fred proposed that effective principals interpret policy.

> [They] define policy by breaking policy. . . .
>
> They are kind of forming their school around the way they break policy, not the way they write policy. . . .
>
> We test them [policy]. We edge them. . . .
>
> I think most of the world thinks that we are here to enforce policy. . . .
>
> If you were 27 years old and you found yourself promoted to principal . . . I could imagine the rookie saying, "You read the school act, you read the . . . [district] policy, you read the school policy, and there it is. Somewhere in there is the answer. (F2: 44-47)

Gerry

Munro Senior Secondary had been administered by Gerry for 10 years. He was in his early fifties and had no other administrative experience. He had 12 years experience as a teacher, had been a laborer, and had served in the military.

Gerry questioned the notion that decisions are made by employing "only explicit knowledge" (G1: 17). He most often viewed implicit knowledge in terms that it becomes "automatic, becomes part of your vocabulary" (G1: 18). Gerry felt comfortable with implicit knowledge, and saw it as having value. Gerry contended that principals seldom, if at all, talk about how implicit knowledge is employed. He indicated that he would not share with the staff how implicit knowledge was used to arrive at a decision; however, he would share this information with certain individuals.

With respect to this study, Gerry stated: "I haven't given this sort of thing this kind of thought. Analyzing this process, like this, is pretty different for me" (G1: 6). In the last interview Gerry explained that he has caught himself "engineering conversations" (G3: 23) unconsciously, and has come to the realization that success depends upon careful planning and preparation, "but not ignoring many things we [Gerry and the investigator] have talked about" (G3: 23). Gerry also mentioned:

> I've got to tell you. I kind of enjoyed these interviews. I don't do many of these studies. . . . But this one is interesting. . . .
>
> This study is really treading in unknown water. . . . But I think it is very interesting.
>
> I can see some use for this type of study for myself and for the educational administration program [at the university]. . . . I think conversations among principals, arising out of fairly real situations, . . . is where the real benefit is. . . . I find there are not many principals that I can talk to about things that we all deal with--who will open up and talk about them. I find principals to be rather guarded. (G3: 19-21)

Paul

Paul was in his mid-forties and was the youngest respondent. His educational career had spanned 18 years: four years administering Gustafson Senior Secondary, two years of other administrative experience, and the remainder teaching most grade levels. Paul had two years experience in government and business.

Paul realized that many terms were used to describe implicit knowledge experiences. He usually referred to the experiences as being related to intuition. He claimed that he felt comfortable with implicit knowledge "because it is practiced in teaching all the time" (P1: 13). Paul was careful with whom he shared his implicit knowledge experiences, but did qualify that he does not consciously attempt to hide such information. Paul was the one respondent who practiced formal meditation and intentionally practiced ways of enhancing his implicit knowledge. Compared to other respondents, Paul was able to focus and discuss with ease a particular aspect of implicit knowledge. The investigator suspects that Paul's knowledge of, and experience in, meditation techniques assisted him in framing ideas with words so that he had little difficulty articulating his thoughts.

In reference to the study and as a closing statement to the interviews, Paul said, "For me, . . . the intuition thing, the implicit knowledge, has been really interesting to think about" (P3: 40). The investigator does not wish to undermine Paul's sincerity; however, his statement regarding the study lacked the detail that was used by some of the other respondents. On the other had, his statement illustrates that the topic was familiar to him. As indicated throughout the study, Paul had done a fair amount of thinking on the topic and related items. He further had some thoughts about the study of implicit knowledge in educational administration. Paul proposed that principals ought to talk about how implicit knowledge is employed and what it means to operating schools both on a professional and personal level. He questioned those people that do "not give any credence . . . to the idea that experiential reflection and intuition have any real value" (P3: 37).

Tom

Fifty year old Tom was in his third year of administering Pratt Senior Secondary. He had had another four years of administrative experience, 10 years teaching experience, and had been a counsellor for two years. Tom had had six years experience as a supervisor and superintendent in correctional institutions, had taught for two years in these institutions, and had run a small business.

Tom was able to focus on a particular aspect of implicit knowledge and discuss it in detail. Probing questions had to be used to elicit details regarding the meaning that Tom attached to implicit knowledge. Prior to probing, Tom's meaning had to be inferred from the information that had been elicited from his nonchalant responses. In reference to his faith in implicit knowledge, Tom stated:

> Wherever you go, you take you with you. I am the sum total of my experiences, and maybe more than that. I rely a great deal on past experiences and what happens. . . . Put it this way, when you don't have a heck of a lot of resources to draw on then you better . . . have faith in your implicit knowledge. (T2: 33)

Tom not only spoke about implicit knowledge with humor, but with sincerity. He often referred to implicit knowledge in terms of reading people and situations for gathering information. In terms of secrecy, Tom would not generally keep his use of implicit knowledge a secret but would be cautious with whom he shared this information. Tom thought the study was interesting, and that he would find the final report fascinating to read because he "would like to see other principals' views and reactions" (T1: 39).

For Tom, there was a strong link between his use of implicit knowledge and how he was going to achieve the visions he had for Pratt Senior Secondary. Unfortunately, frustration set in when he listened to how others, namely conference speakers and the Minister of Education, would educate students.

> I don't mean to paint everybody with the same brush because there are some excellent things that I have learned from people . . . [who] haven't had the experience but have just done the research and have a theory. They research, and then they make a statement, and they have a particular belief, and they present what they think is their program. And it has been really good in some instances. But in more cases than not, I found that these people . . . [are] wrong. If they would just come down to earth, to reality, and put it into practice they would find out that. . . . [it] just isn't going to work. Right now, [the vision of the Minister of Education] . . . is in that category. I think there are a lot of holes in it. I mean, it is smoke and mirrors; it is motherhood and apple pie. I don't think . . . [s/he] is dealing with reality. But there are good things. The best thing about it is that . . . [s/he] has some outrageous goals. (T1: 40-41)

For Tom, the Minister's "outrageous goals" (T1: 41) are appealing because, as Tom said of himself, "I am a visionary, . . . idea, motivating type of individual" (T1: 18).

Findings of the Interpretations

The following findings emerged from an analysis of the interpretations.

1. The respondents were of the opinion that more discussion and study of implicit knowledge in educational administration would be beneficial.

2. The interpretations reinforced the notion that implicit knowledge and its use was idiosyncratic. Views did differ as to what constituted implicit knowledge; at the same time, there was an overlapping of the views. Some respondents saw it as something that was used in determining fairness; others saw it as reading people and situations; intuition and informed intuition were equated with it; or it was viewed as automatic processes, or as the popular notion of a gut feeling. Intuition and the reading of people was referred to in terms of gender; however, the issue never arose with the majority of respondents.

3. Experience, in terms of years, and other demographics related to the respondents were not factors in how implicit knowledge was used or perceived.

CHAPTER 11

Conclusion, Recommendations, Future Research, and Reflections

Introduction

This chapter concludes the study by providing the reader with propositions that have been constructed from the findings. These propositions are followed by recommendations for practice and implications for future research. Added insight into this study is yielded from the investigator's reflections.

Conclusion

An exploration of this study resulted in findings related to the specific research questions. These findings were used to construct propositions. Underlying the findings was each respondent's contextual situation and the study's framework. Caution should be taken when transferring the propositions to other situations. The nature of implicit knowledge of senior secondary principals encompasses the following propositions.

1. Problems are encountered when using the interview technique for eliciting information on implicit knowledge.

Problems were encountered when using interviews to elicit respondents' implicit knowledge. Inherent in this technique was a respondent's requirement to respond using words. A primary problem, which inhibited articulation, was a lack of standard vocabulary by and among the respondents. The form and shape of implicit knowledge experiences were given through respondents' descriptions and the investigator's interpretations. Formalizing the experiences could not be accomplished; what was crucial was that they could be detected and delineated. Furthermore, data had to be elicited through incidents and probing questions. Generally, the investigator found that most of the information elicited came about by letting the respondents talk about incidents related to their implicit knowledge experiences.

2. Certain notions associated with implicit knowledge shadow the principalship: the employment of implicit knowledge is not a rash choice; when implicit knowledge is made comprehensible to others, it is valuable for empowerment purposes; and, in contextual terms, the nature of implicit knowledge is more telling of the principalship than it is of implicit knowledge.

Parameters have been placed on understanding implicit knowledge by suggesting that it is vague and ambiguous, by assuming that it can be formalized into rules and facts, and by measuring various attributes resulting in absolutes. Thus, certain beliefs have evolved which have skewed the value of implicit knowledge. This study showed that the respondents did consider the consequences of employing implicit knowledge in their decisions. Implicit knowledge seldom resulted in rash choices; if anything, the respondents were found to be aware of the benefits and shortcoming of implicit knowledge. Furthermore, the respondents valued it like they would explicit knowledge. If barriers to implicit knowledge existed among the repondents, these were normally associated with external barriers (social) as opposed to internal barriers (personal).

The literature in educational administration mentions that sharing knowledge is required for empowering staffs. The literature on implicit knowledge has overlooked this issue. In this study, the respondents were found to keep the employment of implicit knowledge a secret in the public arena, and that they made implicit knowledge explicit by rationalizing it after the fact: much like a mathematician working on a problem. For the respondents, as with the mathematician, what has been implicitly understood only makes sense once it has been placed into symbols. In terms of empowering staffs, to ignore this process is a form of disempowerment.

This study further indicated that implicit knowledge was used in most contexts of the senior secondary principalship, namely contexts involving a human-resource component. In contextual terms, to understand the nature of implicit knowledge of senior secondary principals is to understand the nature of that principalship.

3. The function of implicit knowledge is best appreciated from a wholistic perspective.

The function of implicit knowledge was found to have a number of operational dimensions. Specifically, it was used throughout the problem-solving process: used for sensing, identifying, and anticipating problems; used for incubation purposes; and used to develop processes. Such specifics are suitable to reductionism, which is normally accompanied by a model or a series of attributes, and provides a limited perspective. The function of implicit knowledge is more than the sum of the operational dimensions. The function is complex: for example, it is void of a model and used in a realm of uncertainty. An appreciation of this complexity is derived from a wholistic perspective--which was more appropriate for investigating the research question.

4. Implicit knowledge is idiosyncratic.

Implicit knowledge was found to be used for administering senior secondary schools. Information elicited from each respondent indicated that the structure and function of implicit knowledge were multiple and individualistic. What constituted implicit knowledge in terms of structure and function varied, yet many overlapping features existed.

5. Implicit knowledge is developed and intensified by experiential enhancers and non-repressive settings.

The findings indicated that implicit knowledge was developed over time, and can not be directly taught; and some of it, knowledge per se or processes, becomes automatic. Implicit knowledge was found to be enhanced through solitude and relaxation, which is in keeping with the literature that suggested that non-repressive settings enhance implicit knowledge. Under special circumstance, interacting with people was found to be an enhancer. Other enhancers included activities associated with introspection and reflection. Learning through osmosis was considered to be an enhancer that had limited discussion in the literature. The literature review suggested that some physical and mental routine activities are enhancers. In reference to this study, most routine activities were at best potential enhancers.

6. Senior secondary principals seldom deliberate on their implicit knowledge.

Findings indicated that the respondents seldom deliberated on their implicit knowledge experiences. As a group, principals seldom shared these experiences. The respondents felt that disciplined discussions of implicit knowledge would be beneficial both on a personal level and for the study of educational administration.

7. Senior secondary principals rely upon apprizers.

Implicit knowledge was used to read people and situations. Such a notion was in keeping with the literature review; but little discussion occurred in regard to reading people for apprizing purposes. The findings showed that the respondents used people as apprizers; furthermore, they used implicit knowledge to read apprizers' implicit knowledge.

8. An unidentifiable transformation process is used to rationalize implicit knowledge after it has been employed.

This study showed that the respondents would rationalize the implicit knowledge that they employed, and make it comprehensible if it was going to be made public. The accuracy of this rationalization was impossible to determine and was deemed unnecessary to investigating the research question.

9.The actions that are taken or the decisions that are made by senior secondary principals are based upon analytic-synthetic skills.

The findings indicated that the respondents seldom arrived at a decision based solely on implicit knowledge; there was the suggestion that decisions were rarely made with only explicit knowledge. When employing implicit knowledge, synthetic skills were required and were often used in conjunction with analytic skills. Some respondents viewed implicit knowledge as incorporating rationality, or the analytic method. This proposition is in keeping with Mintzberg (1976) who suggested that organizational effectiveness is a blend of using both the left and right parts of the brain: planning on the left, the non-creative; and managing on the right, the creative. In line with Mintzberg's frame of thought, analysis would be for planning and synthesis would be for managing. Such a notion is enlightening but constrictive. In reference to the findings, analysis and synthesis occurs in both planning and management.

10. Connectionism is substantive to the implicit knowledge of senior secondary principals.

This study indicated that implicit knowledge was void of a model and complex. In keeping with the computer science literature, implicit knowledge would be difficult to formalize into a set of rules. The notion of connectionism provides a frame for how implicit knowledge was used by the respondents. Connectionism is viewed as a network of cells, each cell influencing the other. Findings from this study, when thought of in this frame, provide insight into the research question. Implicit knowledge was found to be related to connectionism as a result of its metaphoric structure and it being used in one context and applied to another. Proficiency with implicit knowledge, in terms of fluency and due consideration, was found to occur no matter the context.

11. Complementary alignment is substantive to the implicit knowledge of senior secondary school principals.

Implicit knowledge was used to determine if a decision was going to fit the vision a respondent had for the school: the notion of stretching the decision was inappropriate. Complementary alignment was found to be shaped by how the respondents perceived the principalship and the world around them, and was used in decisions involving fairness and ethics. When a respondent's implicit knowledge came into conflict with policy (written or unwritten), implicit knowledge was used to handle this conflict through arbitrariness and creative insubordination.

Summary of the Propositions

From a collective perspective, the 11 propositions form a particular illustration of the nature of implicit knowledge of senior secondary principals. They portray the essence of the research question: implicit knowledge has a major and beneficial role in the senior secondary principalship. Different propositions could have been formulated, however they would come under the guise of one of the 11 propositions. The propositions that were outlined were used as a guide for developing recommendations for practice and implications for future research.

Recommendations

Implicit knowledge requires a higher profile in current thought associated with the practice of educational administration. The following recommendations are made for training school administrators; for system operations, at the provincial and school district levels; and for principals, at the school level.

Training

1. Training ought to promote the use of connectionism and complementary alignment through existing simulation activities such as computer simulations and case studies.

2. A higher profile ought to be given to activities that promote the examination of cultural barriers to implicit knowledge, the use of analytic-synthetic methods, the use of metaphoric analysis, the transformation of implicit knowledge into comprehensive knowledge, and the enhancement

of implicit knowledge.

3. Prospective and practicing administrators ought to be trained in an inductive approach so as to be given the opportunity to work, in and out of the field, with experienced colleagues.

4. Delivery technologies ought to be used that expose administrators to methods that take them beyond praxis and that promote the use of implicit knowledge.

5. Universities ought to work to assist in fulfilling recommendations for system operations and principals.

System Operations

1. Principals ought to be encouraged in a non-repressive setting to use discretion in interpreting the intent of policy.

2. Principals ought to be encouraged to share their implicit knowledge by making it comprehensible.

3. Opportunities ought to be provided for exchanges, visitations, and inservice that explores particular aspects of implicit knowledge.

4. School districts ought to look at ways of providing assistant principals with opportunities to partake in tasks that parallel those found in the principalship and that require the use of implicit knowledge.

Principals

1. Principals ought to deliberate on their implicit knowledge experiences using introspective and reflective techniques that focus on enhancing implicit knowledge abilities.

2. Principals ought to extend their professional readings and other professional development activities to include topics related to implicit knowledge: this includes topics that focus on apprizers and the transformation of implicit knowledge.

3. In terms of empowering school staffs, principals ought to share and make comprehensible their implicit knowledge. To tell staffs that a decision was derived from

implicit knowledge involving particular structural cues is unnecessary; instead, because of external barriers, principals ought to rationalize the knowledge after the fact.

4. Principals ought to promote the value of implicit knowledge for learning and teaching purposes.

Future Research

Given the relatively small amount of understanding that exists on the nature of implicit knowledge of educational administrators, the following may be seen as implications for future research.

1. Research ought to be conducted that explores deeper into each theme. To formalize this information ought to be viewed as a challenge. A standardization of constructs and concepts ought to emerge from the research.

2. Investigations into the cultural barriers, gender differences and similarities, analytic-synthetic skills, complementary alignment, connectionism, the transformation of implicit knowledge, and implicit knowledge enhancers ought to be conducted.

3. Other groups of administrators, in and out of the field of education, ought to be explored and compared to senior secondary principals.

4. Reconceptualizations of implicit knowledge ought to be developed and examined using different samples of respondents. Inquiries ought to be extended to different contexts, such as expertise and leadership.

5. Other elicitation techniques, besides that of interviewing, ought to be used and developed. These techniques ought to take into consideration administrators whom are reluctant to, or have difficulty with, verbally articulating their implicit knowledge experiences.

6. Instruments ought to be used and developed that quantify underlying implicit knowledge abilities of school administrators.

7. Other reporting methods ought to be considered in

inquiries focusing on implicit knowledge: for example, video recording.

Reflections

From the outset of the study, uncertainty was attached to what would ensue, including where the inquiry would lead in terms of its contribution to educational administration. I came to accept the uncertainty in terms of the complexity associated with implicit knowledge. Any foreshadowing found in the literature in regards to examining the research question was supplemented by colleagues and practitioners: from the positive, "It's about time," to the negative, "That's impossible to examine." The comments that stayed with me, and continue to have meaning, were those that were in keeping with what I experienced as the study unfolded: "Treading in water," "A lot of soft and dense data will be required," and "A slippery topic."

Some material from the literature review was considered beyond the scope of this study and applicable to future research endeavors. Nevertheless, this material was important to appreciating the complexity of implicit knowledge. As an example, the issue as to whether implicit knowledge experiences could be transformed into rules and facts for computer programs was discarded. Dreyfus and Dreyfus (1986) claimed that the experiences may be beyond rules and facts. Computers are not sentient beings. At best, computers can only simulate the experiences. Such issues are not suggesting that attempts to formalize implicit knowledge be abandoned. Researchers, such as Berry (1987), claim that this is the challenge for expert systems programing.

The challenge for me came in acknowledging those times that I was "treading in water," and when the topic was "slippery." I had to focus on ways to sort and interpret the host of "soft and dense data" that was collected. In working through the challenge, my thoughts deviated consciously and unconsciously to my own implicit knowledge experiences as well as those of others. My deliberation was followed by journal entries. My experiences became clear, much like the mathematician, when ideas were put into symbols. Discussions with colleagues and other apprizers about the study, to borrow a respondent's phrase, crystallized my thinking. I started a supplementary file for those findings that did not immediately fit one of the study's themes. This file disappeared as the discussions and themes evolved.

I spent time observing teachers, students, and my three year old daughter. The teachers and students constantly employed implicit knowledge in their situations. My closest informant on how implicit knowledge was employed was my daughter. In one of many incidents, she was learning to ride a bicycle with training wheels. Any suggestions I passed on to her were tried and usually discarded within a short time--so much for Dad's advice! What she was able to do, not only through experimentation of falling and getting back on to the bicycle but through implicit processes, was to learn to ride the bicycle on her own within an hour. She learned to coordinate mental and physical skills. Her social skills came into play immediately as she swerved to miss people. To me this was astonishing, not as a parent but as a researcher; to her, it was commonplace in her development. Though my daughter was unable to communicate her experiences to me (unlike the respondents) I was able to observe her in action (unlike the respondents). Observations of my daughter, and of the students and teachers, provided another dimension for crystallizing my thinking.

Since the study has been completed, I have found connections between particular information that was elicited from the respondents and material for future research. As an example, the respondents mentioned the lack of use of a check list. This notion makes me recall a television program I viewed in the past which suggested that catching a ball does not involve a set of rules or a check list; it is a skill by which a person becomes an expert in ball catching. In reference to the computer literature on expert systems, the expert is not able to tell how a ball is caught. Instead, they provide an example. In this study, the respondents told how implicit knowledge was employed through the incidents they described. I am not suggesting that the respondents were expert principals, but what was uncovered was that they did not have a check list for arriving at a decision. To state that they were just doing their jobs is an oversimplification. There is that something else involved, namely implicit knowledge.

Concern regarding where this study would lead has been answered. Overall, the process of this study has contributed to a transformation of my beliefs regarding implicit knowledge. The complexity associated with it makes the answer to the research question appreciated, especially in terms of how little is known in the field of educational administration about implicit knowledge. If the findings are to mean anything for administration, a higher profile for implicit knowledge must be infused in practice and research so as to reap its benefits.

Bibliography

Agor, W.H. (1983). Brain development in management training. Training and Development Journal, 37(4), 78-83.

Agor, W.H. (1985). Intuition as a brain skill in management. Public Personnel Management Journal, 14(1), 15-24.

Agor, W.H. (1986a). The logic of intuition: How top executives make important decisions. Organizational Dynamics, 14(3), 5-18.

Agor, W.H. (1986b). The logic of intuitive decision making. New York: Quorum.

Agor, W.H. (Ed.). (1989). Intuition in organizations. Newbury Park, CA: Sage.

Arkell, R.N. (1976). Naive prediction of pathology from human figure drawings. Journal of School Psychology, 14(2), 114-117.

Belenky, M.F., Clinchy, B.Mc., Goldberger, N.R., & Tarule, J.M. (1986). Women's ways of knowing. New York: Basic Books.

Bell, C.S. (1988). "Complicating" educational administrators. In F.C. Wendal & M.T. Bryant (Eds.), New directions for administrator preparation, UCEA monograph series (pp. 73-80). Tempe, AZ: University Council for Educational Administration.

Benner, P. (1984). From novice to expert. Menlo Park, CA: Addison-Wesley.

Bereiter, C., & Scardamalia, M. (1986). Educational relevance of the study of expertise. Interchange, 17(2), 10-19.

Berg, B.L. (1989). Qualitative research methods for the social sciences. Boston: Allyn and Bacon.

Berger, P.L., & Kellner, H. (1981). Sociology reinterpreted: An essay on method and vocation. Garden City, NY: Anchor Books.

Berger, P.L., & Luckmann, T. (1967). The social construction of reality. Garden City, NY: Anchor Books.

Berliner, D.C. (1986). In pursuit of the expert pedagogue.

Educational Research, 15(7), 5-13.

Berry, D.C. (1987). The problem of implicit knowledge. Expert Systems, 4(3), 144-151.

Boose, J.H. (1985). A knowledge acquisition program for expert systems based on personal construct psychology. International Journal of Man-Machine Studies, 23(5), 495-525.

Brown, D. (1991). Mintzberg: The insightful manager. Management Review, 80(12), 20-22.

Bruner, J.S. (1960). The process of education. New York: Vintage Books.

Brykczynski, K.A. (1989). An interpretive study describing the clinical judgment of nurse practitioners. Scholarly Inquiry for Nursing Practice: An International Journal, 3(2), 75-104.

Buchanan, B.G. (1986). Expert systems: Working systems and the research literature. Expert Systems, 3(1), 32-51.

Callingham, M. (1991). The role of qualitative notions in company decision making. Journal of the Market Research Society, 33(1), 45-49.

Chi, M.T., Feltovich, P.T., & Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. Cognitive Science, 5(2), 121-152.

Chi, M.T., Glaser, R., & Rees, E. (1982). Expertise in problem solving. In R.J. Sternberg (Ed.), Advances in the psychology of human intelligence (Vol. 1, pp. 7-75). Hillsdale, NJ: Lawrence Erlbaum Associates.

Clark, D. L., & Astuto, T.A. (1988). Paradoxical choice options in organizations. In D.E. Griffiths, R.T. Stout, & P.B. Forsyth (Eds.), Leaders for America's schools (pp. 112-130). Berkeley, CA: McCutchan.

Collins, L.F. (1991). Everything is true, but in a different sense: A new perspective in qualitative research. Journal of the Market Research Society, 33(1), 31-38.

Cunningham, L.L. (1985). Leaders and leadership: 1985 and beyond. Phi Delta Kappan, 67(1), 17-20.

Davies, M., & Hakiel, S. (1988). Knowledge harvesting: A practical guide to interviewing. Expert Systems, 5(1), 42-50.

de Bono, E. (1990). I am right - You are wrong. New York: Penguin.

Dreyfus, H.L., & Dreyfus, S.E. (1986). Mind over machine. New York: Free Press.

Durow, W.P. (1987). Ambiguity, tolerance and intuition in the management styles of selected Iowa school administrators (Doctoral dissertation, Iowa State University, 1987). Dissertation Abstracts International, 48, 1068-A.

Eldridge, J.E.T., & Crombie, A.D. (1974). A sociology of organizations. London, UK: George Allen & Unwin.

English, F.W. (1992). The principal and The Prince: Machiavelli and school leadership. NASSP Bulletin, 76(540), 10-15.

Ennamorato, J. (1986). Intuition success strategies. Toronto: NC Press.

Fitts, P.M. (1964). Perceptual-motor skill learning. In A.W. Melton (Ed.), Categories of human learning (pp. 243-285). New York: Academic Press.

Gellman, H. (1992). "Learning organizations": Have competitive advantages. Inside Guide, 6(1), 9-11.

Glaser, B.G., & Strauss, A.L. (1967). The discovery of grounded theory. Chicago: Aldin.

Goldberg, P. (1983). The intuitive edge: Understanding and developing intuition. Los Angeles, CA: Jeremy P. Tarcher.

Goldberg, P. (1989). The intuitive experience. In W.H. Agor (Ed.), Intuition in Organizations (pp. 173-194). Newbury Park, CA: Sage.

Greenfield, W.D. (1988). Moral imagination, interpersonal competence, and the work of school administrations. In D.E. Griffiths, R.T. Stout, & P.B. Forsyth (Eds.), Leaders for America's schools (pp. 207-232). Berkeley, CA: McCutchan.

Grene, M. (Ed.). (1969). Knowing and being: Essays by Michael Polanyi. Chicago: University of Chicago Press.

Griffiths, D.E. (1988). The professorship revisited. In D.E. Griffiths, R.T. Stout, & P.B. Forsyth (Eds.), Leaders for America's schools (pp. 273-283). Berkeley, CA: McCutchan.

Griffiths, D.E., Stout, R.T., & Forsyth, P.B. (Eds.). (1988). Leaders for America's schools. Berkeley, CA: McCutchan.

Griffiths, D.E., Stout, R.T., & Forsyth, P.B. (1988). The preparation of educational administrators. In D.E. Griffiths, R.T. Stout, & P.B. Forsyth (Eds.), Leaders for America's schools (pp. 284-304). Berkeley, CA: McCutchan.

Guba, E.G. (1978). Towards a methodology of naturalistic inquiry in educational evaluation. CSE Monograph Series in Evaluation, 8. Los Angeles, CA: Center for the Study of Evaluation, University of California.

Guba, E.G., & Lincoln, Y.S. (1982). Epistemological and methodological bases of naturalistic inquiry. Educational Communication and Technology Journal. 30(4), 233-252.

Hallinger, P., & Murphy, J. (1991). Developing leaders for tomorrow's schools. Phi Delta Kappan, 72(7), 514-520.

Halseth, J.H. (1989). Intuition in decision making by human service administrators. (Doctoral dissertation, Western Michigan University, 1988). Dissertation Abstracts International, 50, 483-A.

Handy, C. (1989). The age of unreason. London, UK: Arrow.

Herbeson, E. (1992). Personality type and self-directed learning. Canadian School Executive. 12(2), 8-13.

Hertz, D.B. (1988). The expert executive. New York: John Wiley & Sons.

Hetzel, R.W. (1992). Solving complex problems requires good people, good processes. NASSP Bulletin, 76(540), 49-55.

Huseman, R.C. & Hatfield, J.D. (1989). Managing the equity factor. Boston: Houghton, Mifflin.

Isenberg, D.J. (1984). How senior managers think. Harvard

Business Review, 62(6), 80-90.

Jeffery, J.R. (1990). Factors influencing the professional ethical behaviour of school principals in Newfoundland and Labrador. Unpublished doctoral dissertation, University of Alberta, Edmonton, AB.

Johnson, P.E. (1983). What kind of expert should a system be? The Journal of Medicine and Philosophy, 8(2), 77-97.

Kaplan, A. (1964). The conduct of inquiry. San Francisco, CA: Chandler.

Kidd, A.L., & Cooper, M.B. (1985). Man-machine interface issues in the construction and use of an expert system. International Journal of Man-Machine Studies, 22(1), 91-102.

Kiesler, S., & Sproull, L. (1982). Managerial response to changing environments: Perspectives on problem sensing from social cognition. Administrative Science Quarterly, 27(4), 548-570.

Knight, D.G. (1991). Implementing policy: A case study of two principals. Unpublished doctoral dissertation, University of Alberta, Edmonton, AB.

Kohli, W. (1991). Postmodernism, critical theory and the "new" pedagogies: What's at stake in the discourse? Education and Society, 9(1), 39-46.

Krager, L., & Brown, R.D. (1992). Administrative decision-making: Do time, management level, and problem context make a difference? NASPA Journal, 29(2), 121-130.

Lampert, M., & Clark, C.M. (1990). Expert knowledge and expert thinking in teaching: A response to Floden and Klinzing. Educational Researcher, 19(5), 21-23, 42.

Law, N. (1988, April). Knowledge structures - Where can we find them. Paper presented at the meeting of the American Education Research Association, New Orleans, LA.

Leithwood, K.A., & Stager, M. (1989). Expertise in principals' problem solving. Educational Administration Quarterly, 25(2), 126-161.

Leithwood, K.A., Steinbach, R., Ross, P.N., & Hamilton, D.N.

(1991, June 3). The nature and role of socialization experiences in the development of administrator expertise. Paper presented at the Annual Meeting of the Canadian Association for Studies in Educational Administration, Kingston, ON.

Leslie, D.W., Snyder, W., & Giddis, W.J. (1988). Can graduate programs support competency-based administrator preparation? In F.C. Wendal & M.T. Bryant (Eds.), New directions for administrator preparation, UCEA monograph series (pp. 25-36). Tempe, AZ: University Council for Educational Administration.

Lincoln, Y.S., & Guba, E.G. (1985). Naturalistic inquiry. Beverly Hills, CA: Sage.

Macharzina, K., & Engelhard, J. (1991). Paradigm shift in international business research: From partist and eclectic approaches to GAINS paradigm. Management International Review, 31(Special Issue), 23-43.

"Mac" Macpherson, R.J.S. (1988). Talking up and justifying organisation: The creation and control of knowledge about being organised. In D.E. Griffiths, R.T. Stout, & P.B. Forsyth (Eds.), Leaders for America's schools (pp. 160-182). Berkeley, CA: McCutchan.

McGuire, J.B. (1986). Management and research methodology. Journal of Management, 12(1), 5-17.

Miklos, E., & Chapman, D. (1986, April). Reflections on educating educational administrators. Paper presented to the Symposium, on International Perspectives on Administrator Preparation, annual meeting of the American Education Research Association, San Francisco, CA.

Miller, A.F., & Hanson, M. (1992). The smile on the face of a leadership tiger. Inside Guide, 6(1), 14-17.

Miller, J.P. (1988). The holistic curriculum. Toronto, ON: Ontario Institute for Studies in Education.

Mintzberg, H. (1976). Planning on the left side and managing on the right. Harvard Business Review, 54(4), 49-58.

Montgomerie, C., Peters, F., & Ward, K. (1991). Educational leadership in Alberta. Edmonton, AB: Department of Educational Administration, University of Alberta, AB.

Murphy, J., & Hallinger, P. (1989). A new era in the professional development of school administrators: Lessons from emerging programmes. Journal of Educational Administration, 27(2), 22-45.

Myers, I.B., & Myers, P.B. (1980). Gifts differing. Palo Alto, CA: Consulting Psychologists Press.

Nadel, I.B. (1984). Biography: Fiction, fact and form. London, ON: Macmillan.

Norris, C.J.,& Achilles, C.M. (1988). Intuitive leadership: A new dimension for educational leadership. Planning and Changing, 19(2), 108-117.

Norris, S.P. (1985). Synthesis of research on critical thinking. Educational Leadership, 42(8), 40-45.

Pohland, N.J. (1988, October). Administrator preparation programs: Levels of discourse. Paper presented at the Second Annual Convention of the University Council for Educational Administration, Cincinnati, OH.

Pohland, P., Milstein, M., Schilling, N., & Tonigan, J.S. (1988). Emergent issues in the curriculum of educational administration: The University of New Mexico case. In F.C. Wendal & Bryant (Eds.), New directions for administrator preparation, UCEA monograph series (pp. 37-62). Tempe, AZ: University of Council for Educational Administration.

Polanyi, M. (1958). Personal knowledge. London, UK: Routledge & Kegan Paul.

Polanyi, M. (1966). The tacit dimension. Garden City, NY: Doubleday.

Polanyi, M. (1969). Sense-giving and sense-reading 1967. In M. Grene (Ed.), Knowing and being: Essays by Michael Polanyi (pp. 181-207). Chicago: University of Chicago Press.

Popper, S.H. (1990). Pathways to the humanities in school administration (3rd ed.). Tempe, AZ: University

Council for Educational Administration.

Prestine, N.A., & LeGrand, B.F. (1991). Cognitive learning theory and the preparation of educational administrators: Implications for practice and policy. Educational Administration Quarterly, 27(1), 61-89.

Province of Newfoundland and Labrador. (1989). Professional development for school administrators. Report of the provincial needs assessment. St. John's, NF: Division of School Services.

Ray, M., & Myers, R. (1989). Practical intuition. In W.H. Agor (Ed.), Intuition in Organizations (pp. 247-261). Newbury Park, CA: Sage.

Renihan, F.I, & Renihan, P.J. (1992). Educational leadership: a renaissance metaphor. Education Canada, 32(1), 8-14.

Riggs, G.L.S. (1986). The use of intuition by managers of major corporations in Washington State. (Doctoral dissertation, Gonzaga University, 1985). Dissertation Abstracts International, 47, 979-A - 980-a.

Robson, S. (1991). Ethics: Informed consent or misinformed compliance? Journal of the Market Research Society, 33(1), 19-28.

Rowan, R. (1989). What it is. In W.H. Agor (Ed.), Intuition in Organizations (pp. 278-88). Newbury Park, CA: Sage.

Rowles, E. (1991). The nature of teacher expertness and its attainment. Unpublished doctoral dissertation, University of British Columbia, Vancouver, BC.

Sanders, C.G. (1980). Assessment of inservice training needs of principals in an Alberta school system. Unpublished Master's thesis, University of Alberta, Edmonton, AB.

Sanford, A.J. (1985). Cognition and cognitive psychology. London, UK: Weidenfeld and Nicolson.

Schon, D.A. (1983). The reflective practitioner. New York: Basic Books.

Schon, D.A. (1987). Educating the reflective practitioner. San Francisco, CA: Jossy-Bass.

Seaton, E.C. (1978). Selected preparation program needs for educational administrators in the province of Alberta. Unpublished doctoral dissertation, University of Calgary, Calgary, AB.

Sergiovanni, T.J. (1989). Mystics, neats and scruffies: Informing professional practice in educational administration. Journal of Educational Administration, 27(2), 7-21.

Sergiovanni, T.J. (1991). The dark side of professionalism in educational administration. Phi Delta Kappan, 72(7), 521-526.

Sharman, D., & Kendall, E.J.M. (1988). A case study: Acquiring strategic knowledge of expert system development. IEEE Expert, 3(3), 32-40.

Shuell, T.J. (1986). Cognitive conceptions of learning. Review of Educational Research, 56(4), 411-436.

Shuell, T.J. (1990). Phases of meaningful learning. Review of Educational Research, 60(4), 531-547.

Simon, H.A. (1989). Making management decisions: The role of intuition and emotion. In W.H. Agor (Ed.), Intuition in Organizations (pp. 23-39). Newbury Park, CA: Sage.

Sternberg, R.J. (1990). Metaphors of mind. Cambridge, MA: Cambridge University Press.

Stewart, D.W. (1991). Theoretical foundations of ethics in public administration: Approaches to understanding moral action. Administration & Society, 23(3), 357-373.

Sykes, W. (1991). Taking stock: Issues from the literature on validity and reliability in qualitative research. Journal of the Market Research Society, 33(1), 3-12.

Taschdjian, E. (1989). The lure of the experts. Cybernetica, 32(1), 79-86.

Taylor, E. (1989). The experience of intuition in management decision making: A phenomenological inquiry and consolidation of a model. (Doctoral dissertation, The Union for Experimenting Colleges and Universities, 1988). Dissertation Abstracts International, 49, 2729-A -

2730-A.

Thompson. J.A. (1988). The second wave of educational reform: Implications for school leadership, administration, and organization. In F.C. Wendal & M.T. Bryant (Eds.), New directions for administrator preparation, UCEA monograph series (pp. 9-24). Tempe, AZ: University Council for Educational Administration.

Townsend, D., Butt, R., & Engel, S. (1991). Collaborative autobiography, action research, and professional development. The Canadian Administrator, 30(7), 1-6.

Vaughan, F.E. (1989). Varieties of intuitive experience. In W.H. Agor (Ed.), Intuition in Organizations (pp. 40-61). Newbury Park, CA: Sage.

Wagner, R.K., & Sternberg, R.J. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. Journal of Personality and Social Psychology, 49(2), 436-458.

Warren, M. (1991). Another day, another debrief: The use and assessment of qualitative research. Journal of the Market Research Society, 33(1), 13-17.

Weick, K.E. (1982). Administering education in loosely coupled schools. Phi Delta Kappan, 63(10), 673-676.

Weller, J. (1988). Women in educational leadership. Monograph of the Center for Sex Equality, 3(4), 1-6.

Wells, S. (1991). Wet towels and whetted appetites or a wet blanket? The role of analysis in qualitative research. Journal of the Market Research Society, 33(1), 39-44.

Wendal, F.C., & Bryant, M.T. (1988). New directions for administrator preparation, UCEA monograph series. Tempe, AZ: University Council for Educational Administration.

Wiegner, K.K. (1992). Parallel thinking. Forbes, 149(3), 92-93.

Wielinga, B.J., & Breuker, J.A. (1985). Interpretation of verbal data for knowledge acquisition. In T. O'Shea (Ed.) Advances in artificial intelligence: Proceedings of the Sixth European Conference on Artificial Intelligence, *ECAI-84, Pisa, Italy* (pp. 3-12). Amsterdam: Elsevier Science.

Yin, R. (1984). *Case study research: Design and methods*. Beverly Hills, CA: Sage.

APPENDICES

Appendix A

Preliminary Interview Guide

Preliminary Interview Guide

1. How do you go about employing knowledge to make your most important decisions? Please be specific. [Encourage the respondent to give an example if they are having difficulty answering this question. Focus on types of information and types of problems.]

2. How do you tell if a particular decision [action] is "right" or "wrong"? [e.g., "What kind of feelings/signals do you get or regularly rely on for cues?"]

3. Give an example of a very important decision where the decision proved to be the right one. [Ask for a second example.]

4. Give an example of a very important decision where the decision proved to be the wrong one. [Ask for a second example.]

5. Thinking back about these times (referring to responses in questions #4 and #5), can you pinpoint any specific factors about yourself or your surroundings which seemed to exist or be present when your decision appeared to be right? To be wrong? [Seek explanations.]

6. Do you believe that you use another type of knowledge besides that of conscious knowledge to guide your most important decisions? [To guide your actions? Ask question #6 if the idea of unconscious knowledge (implicit knowledge) has not been raised. Introduce the concept of unconscious knowledge as the other type of knowledge. If deemed necessary, go back to questions #1 through #5 with a focus on unconscious knowledge.]

7. (a) Do you tend to "keep it a secret" that you use unconscious knowledge to make decisions?

(b) Do you feel comfortable sharing this fact with others? [If necessary, probe for details.]

8. (a) When using unconscious knowledge, have you found that it functions best only with certain problems/issues/circumstances?

(b) Or do you use it freely to help guide all major decisions? [If necessary, probe for details.]

9. When making a major decision, do you use any particular technique or method(s) to help draw on your ability to use unconscious knowledge more effectively? [If necessary, probe for details.]

10. Do you regularly use or practice any particular technique or method(s) to help develop your ability to use unconscious knowledge? [If necessary, probe for details.]

Appendix B

Acknowledgment Form

Acknowledgment Form

Please fill in the following information.

Yes, I would be willing to participate in the study on the nature of implicit knowledge of senior secondary school principals. I understand that I have the right to opt out of this, or any part of this, study at any time and that confidentiality is ensured.

My name is ______________________________

I may be contacted at ____________________ (Home phone)

____________________ (Other phone)

Date: __________________________

Signature: ______________________

Thank you for your willingness to participate in this study.

Sincerely,

Kirk J. Salloum
Ph.D. Candidate
Department of Educational
Administration
University of Alberta

Dr. Ken Ward
Supervisor
Department of Educational
Administration
University of Alberta

Appendix C

Case Study

Robert James was an experienced senior secondary principal of a suburban school of 450 students. The middle-class parents were pleased with the school, and the community supported many school events.

At the end of the school year, Robert hired Shawn Brown to fill a History and Social Studies position. Shawn, fresh from university, described himself during his placement interview as a Renaissance extrovert and said that he enjoyed the university's extra-curricular activities more than the classes. Robert hired him because he sensed excellence, a willingness to get students involved, and a value system that complemented the school objectives.

Out of school, Shawn was noted for his social gatherings. Robert was fond of Shawn and had attended a few of his parties.

At school, Shawn's instructional strategies were different from those of other teachers. His classes could be described as a deviation from the school norm. Robert realized that Shawn was an intelligent and creative teacher. Shawn often told Robert that he was "not anti-authority per se, but would rather ignore it." Furthermore, Shawn appeared cynical and sarcastic at staff meetings. He frequently mentioned that schools were constraining and adult oriented. He also criticized procedures that were taken for granted at the school.

Shawn could be tough with students. Once he cancelled a field trip to a museum the morning the students were to leave. A half dozen students were "goofing around" while being given instructions. As Shawn tried to gain control, the other students snickered at his commands. He decided that the students were not worthy of the field trip because of their behavior and lack of cooperation.

Shawn was noted for the frank comments he would write in student report cards and assignments. Parents did not appreciate many of these. Students in Shawn's classes had their highs and lows with him but, for the most part, they enjoyed themselves.

Generally, Robert considered that Shawn was doing a fine job, but it was always on his terms. Early in March, Robert had an experience with Shawn that caused him a high level of anxiety. He went to Shawn's class. No one was in the room. As it turned out, Shawn had taken his class down to the park. What occurred at the park was educational. Robert called Shawn into his office to have him explain his actions. Robert became a bit hot under the collar. Shawn had put his arm around Robert and told him not to worry. Shawn said he just forgot to mention it and that it would not happen again.

1. How would you address this situation?

2. How would you have handled Shawn prior to the March incident?

Appendix D

Letter Concerning the Member Check

Dear _______,

RE: Transcripts from the interviews conducted with you

Enclosed are those sections of the transcripts which may be quoted in my dissertation. I have taken the liberty to edit these for flow.

I am pleased with the information that you have provided. I am requesting that you read the material for accuracy. Feel free to make changes as you see appropriate. In order to retain confidentiality, I have used generic terms or pseudonyms. If you have any concerns please highlight these, and if you have any questions please give me a call.

I plan to move to Vancouver by mid-June. Therefore, I am requesting that the enclosed material, with any changes, be returned to me in the self-addressed envelope by mid-April. If you are unable to return the material by this time please contact me or Ken.

I will forward you a copy of the dissertation when I have passed my final examination. . . .

I would like to thank you once again for your participation in this study. I look forward to meeting with you.

Yours sincerely,

Kirk J. Salloum (Ph.D. Candidate)
Department of Educational Administration

Dr. Ken L. Ward (Supervisor)
Department of Educational Administration

Appendix E

Referencing Scheme

Referencing Scheme

The referencing scheme used in the transcripts for research, reporting, and quoting purposes can be deciphered through the letters and numbers found within a set of parentheses. The first letter of a respondent's pseudonym appears after the first parenthesis. The respondents' pseudonyms are Bill, Fred, Gerry, Paul, and Tom. This letter is followed by a number which indicates the interview session. Following the colon are the page numbers of the transcript for that interview session.

For example, Fred claimed: "There are things like that I think any good administrator can sense. You can feel it in your bones, and you can project yourself into that kind of situation" (F3: 8). (F3: 8) indicates that the quotation came from Fred's third interview session and that the quotation appeared on page 8 of the transcript.